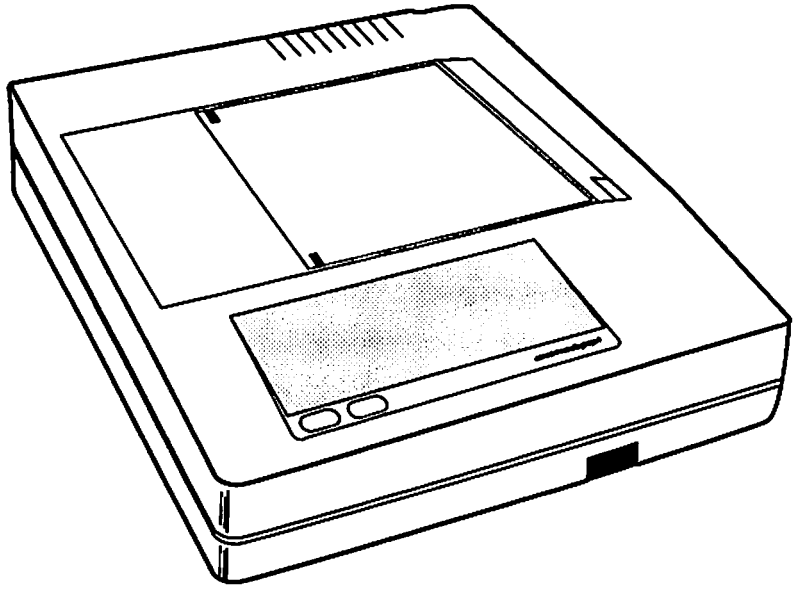
SIEMENS

Operator's manual



BURDICK E550
Electrocardiograph

Operator's Manual Part No. 086064
Revised 12-91

Siemens Burdick, Inc. 15 Plumb Street Milton, WI U.S.A. (608) 868-6000

CAUTION — The BURDICK E550 is a restricted device. Federal law restricts the sale, distribution, or use of this device to, by, or on the lawful order of a health professional.

DANGER — Explosion hazard. Do not use this device in the presence of flammable anesthetics.

NOTICE — Computer assisted interpretation is a valuable tool when used properly. However, no automated analysis system is completely reliable and interpretations should be reviewed by a qualified physician before treatment or non-treatment of any patient.

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1 Introduction

UNPACKING

Carefully remove the E550 Electrocardiograph from its shipping container. All Siemens Burdick products are thoroughly tested and inspected prior to shipment. However, damage can occur during transit. Immediately examine your E550. If damage is visible, contact your shipping agent as soon as possible to arrange for a concealed damage report. Complete the warranty registration card and return it to Siemens Burdick.

ACCESSORIES

The following standard accessories are included with the E550 Electrocardiograph:

- 10-Lead ECG Patient Cable, #007514
- AC Power Cord, #047262
- Disposable Sensor Starter Kit, (100 sensors, 10 clips)
- Ground Lead Wire, #007173
- Operator's Manual, #086064
- Physician's Guide, #086002
- Recording Paper, Thermal Z-Fold, #007868

Please ensure that all the standard accessories have been included. If any items are missing, immediately notify your Siemens Burdick dealer or Siemens Burdick, Inc. at (800) 777-1777 or (608) 868-6000. Additional or replacement accessories are available.

The following optional accessories also are available:

- Modem Kit, 300/1200 Baud, #101004
- 4 Limb Plates, #007157
- 4 Limb Straps, #007158
- 6 Welsh Bulbs, #007364
- Liqui-cor® (6 oz.), #007886
- 50 Lectro-Pads®, #007853
- 1000 Signa Sensors, 10 clips, #047866
- 1000 Signa II Sensors, 10 clips, #047029
- ECG Cart, #007560
- Unicart III, #007084

☞ *NOTE: Your BURDICK E550 Electrocardiograph has been designed to produce diagnostically accurate records with maximum definition and quality. It is intended for use only with quality ECG supplies. The reliability and performance of your electrocardiograph are directly affected by the supplies you use with it.*

Use only Siemens Burdick thermally responsive chemical ECG paper or equivalent — Siemens Burdick product number 007868. Damage due to the use of incorrect paper will void the warranty.

ABOUT THE E550

The BURDICK E550 Interpretive Electrocardiograph is a high fidelity, solid-state instrument. For maximum patient safety, all ECG patient leads are electrically isolated from the chassis and power input. The E550 meets the frequency response recommendations of the Association for the Advancement of Medical Instrumentation and is in compliance with all accepted specifications for leakage current.

The E550 is a multi-channel interpretive electrocardiograph capable of acquiring and storing up to 60 ECG records in its memory. The E550 is operated by selecting from various menu options which are presented on its liquid crystal display. The menus are context sensitive and provide an interactive means of operating the electrocardiograph. A thermal array writer is used as an output device to print text and ECG waveforms for permanent records on 8 1/2" x 11" Z-fold paper.

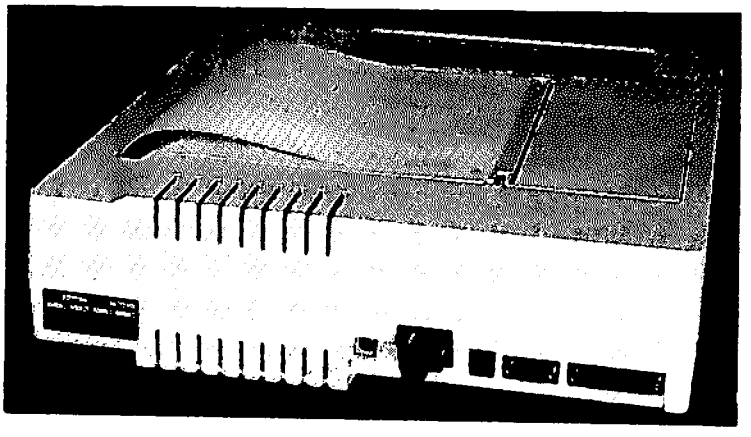
The E550 Electrocardiograph performs diagnostic ECG interpretation and can be operated in manual, automatic, and semi-automatic modes. An internal battery provides adequate power for acquiring ECGs and making hard copy print-outs. An optional external battery pack also is available to provide expanded portability. Standard three, four, and six-channel ECG formats are available at paper speeds of 5, 25, or 50 mm/sec. Gain can be selected at 5, 10, or 20 mm/mv. Also, the E550 can transmit and receive ECG records when used with the E-Scribe ECG Management System or other compatible Siemens Burdick electrocardiographs.

2 *Installation*

CABLE ATTACHMENTS

The E550 can communicate with Burdick's E-Scribe ECG Management System and other Burdick equipment by means of a direct connection or the telephone line. The 9-pin connector located on the back of the unit (Fig. 1) is used when making a direct connection to the E-Scribe or other Burdick equipment. This connector also may be used to connect an external high speed modem if desired. The standard phone jack on the back of the E550 and the 25-pin connector are not used.

Figure 1
Rear Panel



POWER CONNECTION & GROUNDING

The E550 is supplied with a 3-conductor, hospital grade, power cable. Connect the cable between the rear panel of the E550 and a properly maintained and grounded electrical wall outlet.

☞ *CAUTION: To avoid damage, the E550 must be operated only at the line voltage and frequency specified on the rating label.*

When the E550 is properly grounded, maximum safety and performance are ensured for both patient and operator. An auxiliary ground lead wire is provided for additional protection. In cases where AC interference is traced to inadequate grounding, the auxiliary ground lead wire may be connected between the E550 rear panel ground jack and a

metal bed frame, metal table, or cold water pipe. The ground wire plug can accept an additional ground wire if one is required.

BATTERY POWER

The E550 has an internal, rechargeable battery which allows it to be portable for convenient ECG acquisition. Battery power is used whenever the power switch is OFF (1 = on, 0 = off) and the ON/STBY key is activated.

On battery power, ECGs can be acquired and reviewed, but not printed. There is enough battery power for approximately one hour of continuous use before recharging is necessary. After that time, the E550 displays the message *batt needs charging*. After approximately one hour and twenty minutes of continuous use, the E550 displays the message *insufficient charge to continue* and goes to standby (STBY). The E550 needs approximately six hours to fully recharge itself.

The battery is automatically recharged whenever the E550 is plugged in and the power switch is turned ON (1 = on, 0 = off).

The E550 can be operated while recharging. However, the time required to reach a full charge increases accordingly if it is used while recharging. In order to conserve power, the display turns off and the E550 automatically goes to standby (STBY) after about three minutes if no keys are pressed.

4 *Operating the E550*

GETTING STARTED

Before using the E550, read the next few pages to acquaint yourself with its features. This will provide you with information about the basic controls and menu system, as well as how to load the paper.

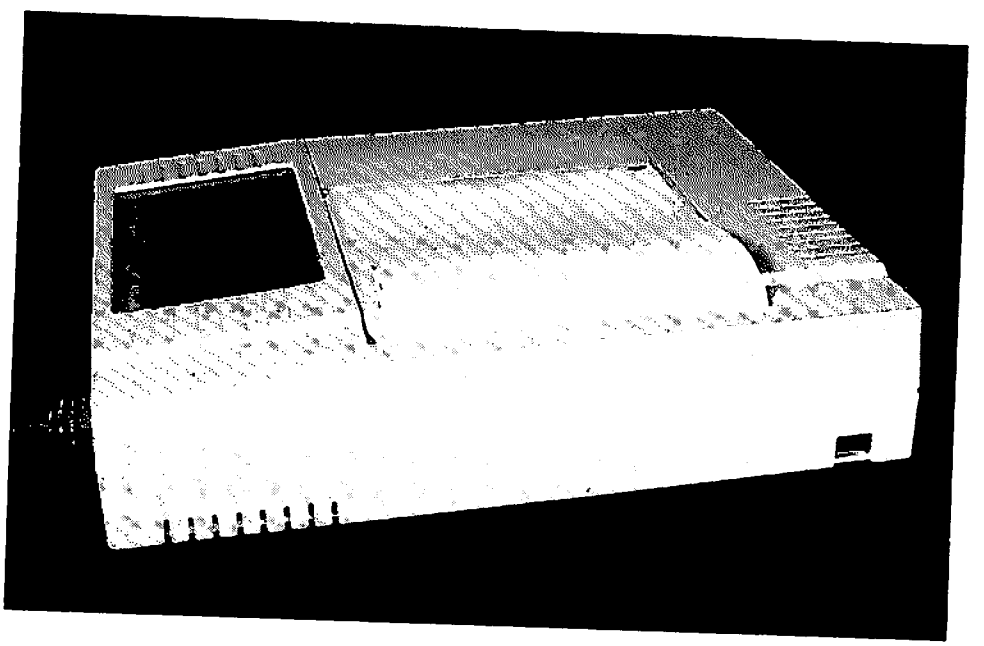
Basic Controls

The AC (alternating current) power switch is on the right side near the rear (Fig. 4). This is a simple toggle switch marked with 0 and 1 (0 = off, 1 = on). Whenever the switch is ON, printing is enabled and the internal battery is charged. When it is OFF, the display operates from battery power.

☞ *NOTE: When the power switch is OFF, the Print and Auto Receive functions are not available. However, ECGs still can be acquired and stored in memory.*

Also, the E550 processes keyboard information only after menu transitions. This means that you must exit the menus properly before any changes will be saved.

Figure 4
AC Power Switch



The display screen is activated by pressing ON/STBY on the front panel (Fig. 5). After a few seconds, the E550 Main Menu will appear.

The Contrast control is located just to the right of the ON/STBY key. You can adjust the contrast until it best suits your particular viewing angle. Press at the left side of the control to decrease contrast and at the right side to increase it.

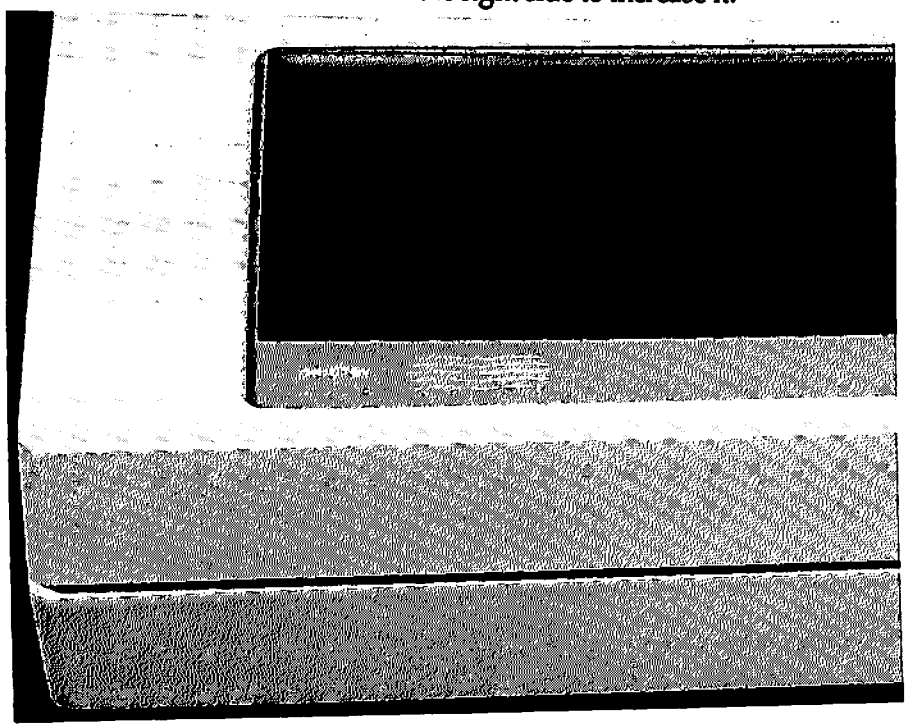


Figure 5 *On/Stby, Contrast Controls*

Status indicators along the bottom left of the display (Fig. 6) give information about whether the power switch is on or off and the condition of the internal battery. The message *battery bulk charging, battery charging,* or *battery fully charged* appears when the power switch is on. The message *printing not available* appears when the power switch is off. Note that the AC On/Off status indicator does not update immediately.

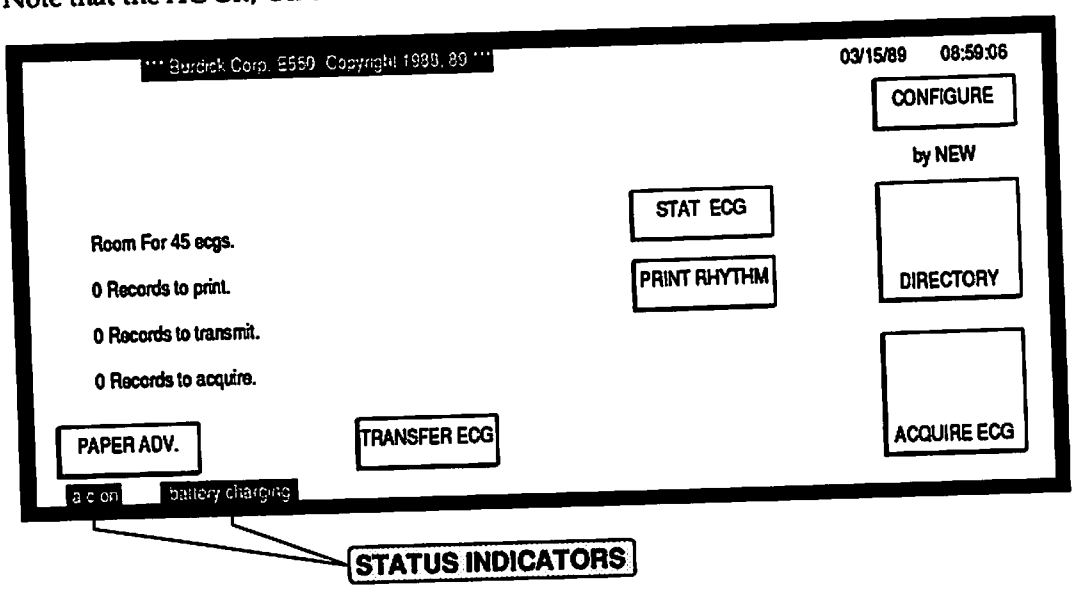
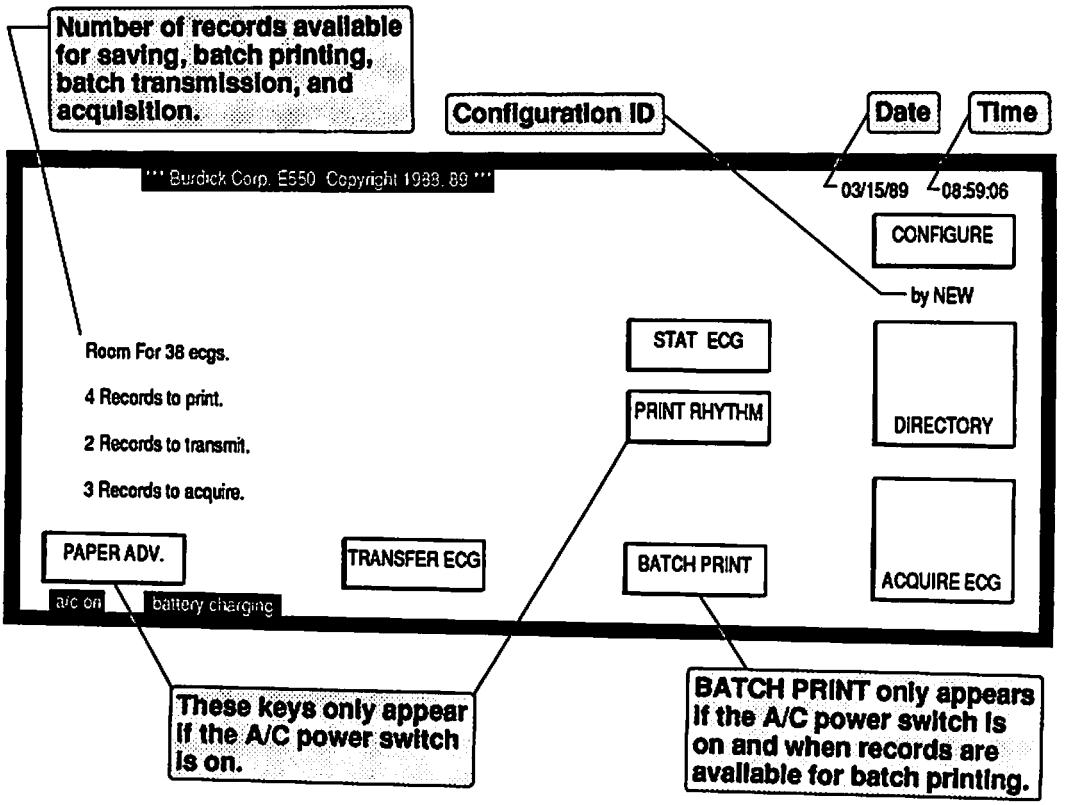


Figure 6 *Status Indicators*

Main Menu

The Main Menu is the starting point for all of the E550's functions (Fig. 7). Date and time are displayed at the top right corner and status information across the bottom. The Main Menu also shows how many records are available for saving, batch printing, batch transmission, and acquisition.

Figure 7
Main Menu



Menu choices appear on the screen as boxes. You can think of these boxes as individual keys which are pressed to initiate various functions. Refer to the Quick Reference for a general overview of the menu system.

☞ *NOTE: Do not touch the screen unless you intend to press a key. It is very sensitive. Do not set objects on the display or lean on it. This can cause undesirable results!*

These keys appear on the Main Menu:

CONFIGURE → Displays the Configuration Menu. This allows you to set up the default operating parameters. (See CONFIGURING THE E550.)

DIRECTORY → Displays the patient Directory. This allows you to access records stored in memory. (See USING THE DIRECTORY.)

ACQUIRE ECG → Displays the patient ID menu. This allows you to enter or edit the patient demographics, then acquire an ECG according to the current acquisition mode. (See ENTERING PATIENT DEMOGRAPHICS and ACQUIRING RECORDS.)

TRANSFER ECG → Displays the Patient Record(s) Transfer Mode Menu. This allows you to send or receive records. (See TRANSFERRING RECORDS.)

When the power switch is on, these keys also appear on the Main Menu:

STAT ECG → Allows you to quickly acquire an ECG by skipping the patient demographics screens. (See ACQUIRING RECORDS.)

PRINT RHYTHM → Allows you to quickly print a rhythm strip by skipping the patient demographics screens. (See PRINTOUTS.)

PAPER ADV. → Advances the paper for one full sheet.

BATCH PRINT → Prints all records not previously printed. (See PRINTOUTS.)

Loading Paper

Use the following procedure to load paper into the E550:

1. First, remove paper from package and open paper compartment.
2. Place paper stack into compartment (Fig. 8). Be sure the queuing holes are at *top right hand side* of E550 and colored paper edges are at the *bottom* of stack.
3. Lift top sheet from stack and place in slot between silver bar and roller *with grid marks facing down*. (Fig. 9).
4. Close paper compartment lid (Fig. 10).
5. Press the PAPER ADV key at lower left corner of screen so paper advances for at least one full sheet (Fig. 11). The AC power switch must be ON.

☞ *WARNING: Use only Burdick chemical (thermally responsive) ECG paper or equivalent — Burdick product number 007868. Damage due to the use of incorrect paper will void your warranty!*

Figure 8
Insert Paper into Compartment

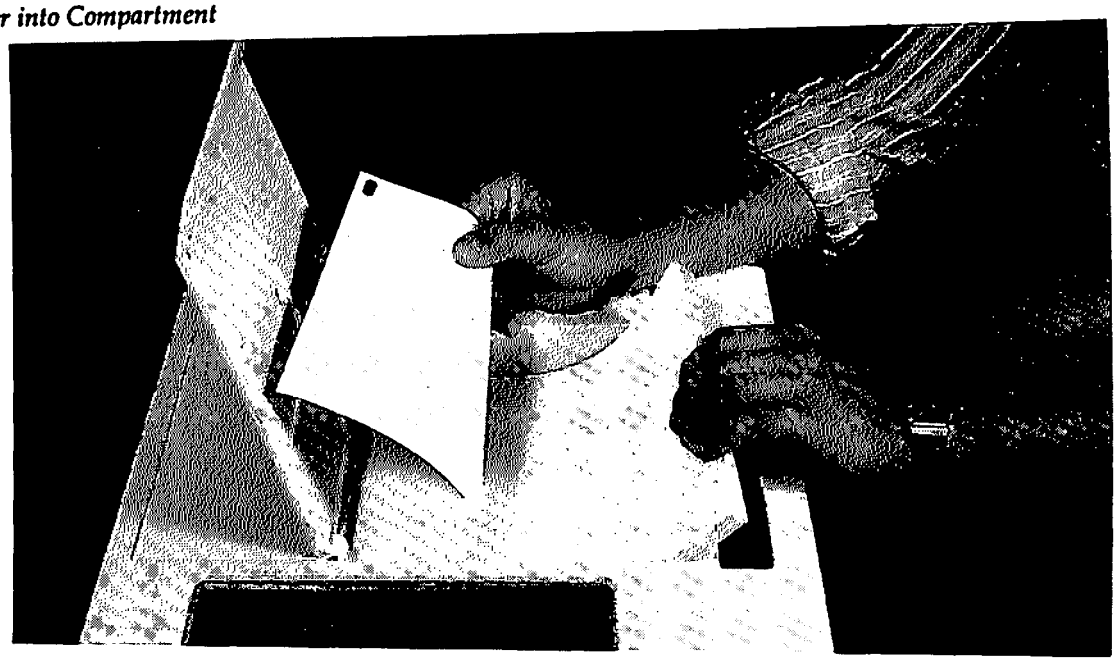


Figure 9
Feed Paper into Slot

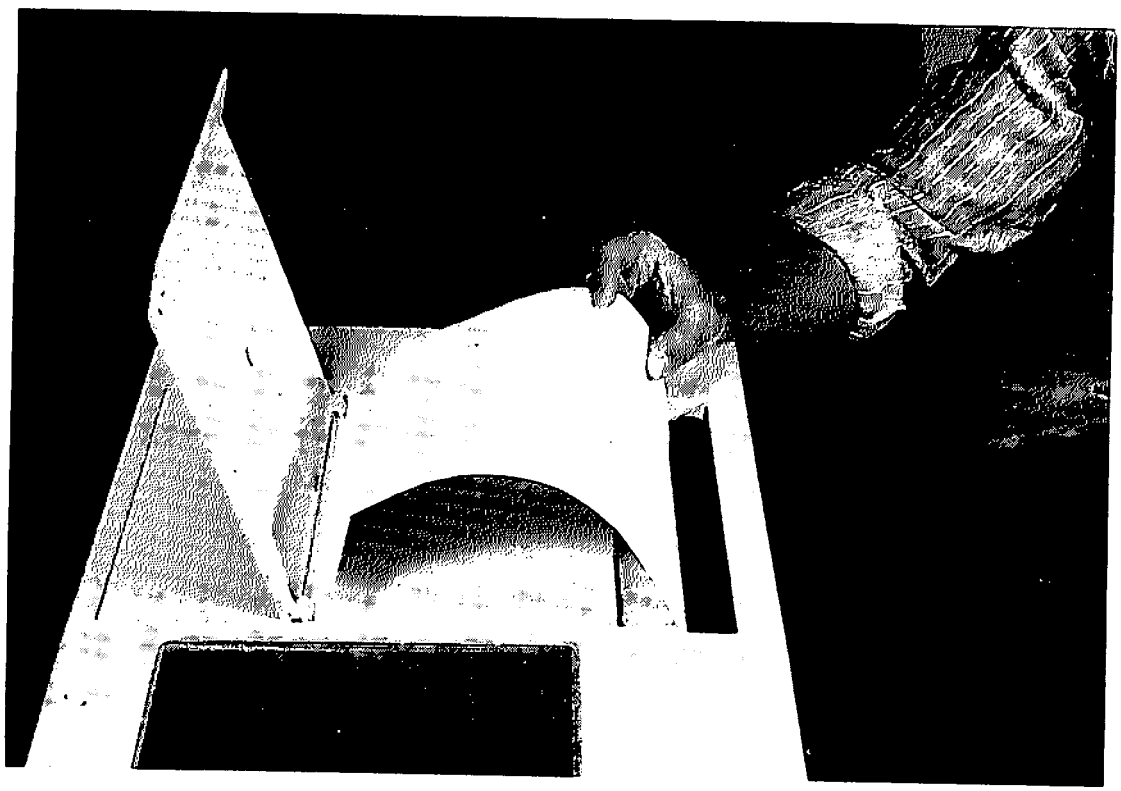


Figure 10
Close Compartment Door

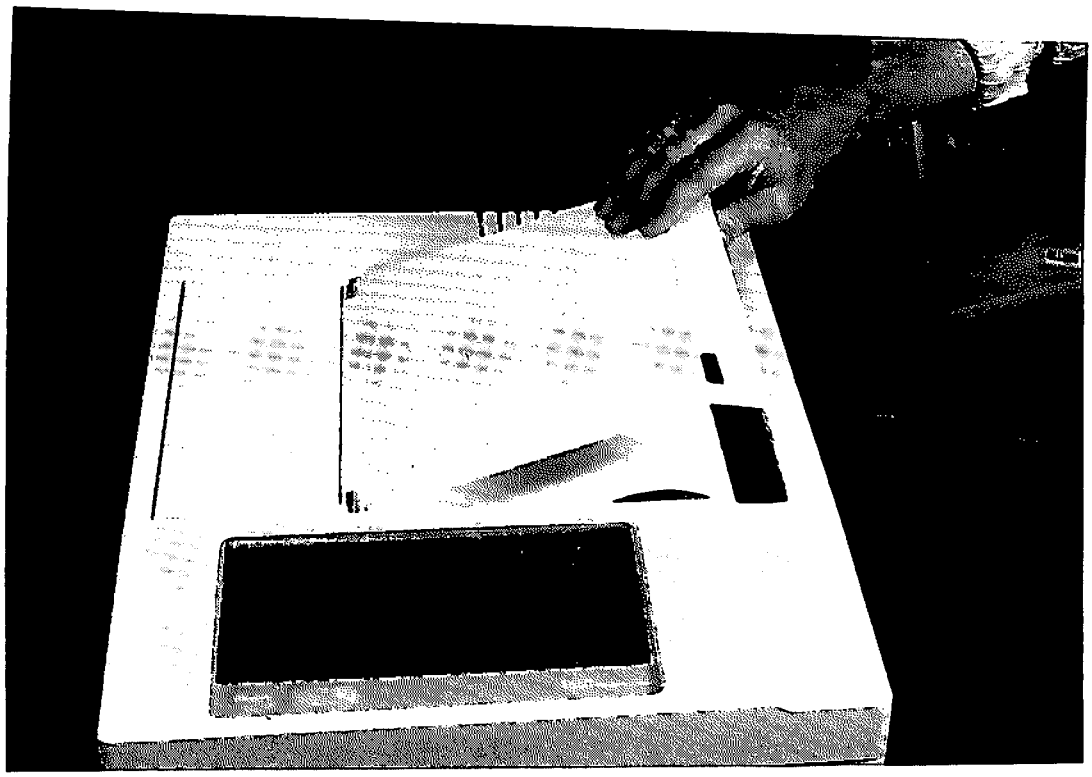
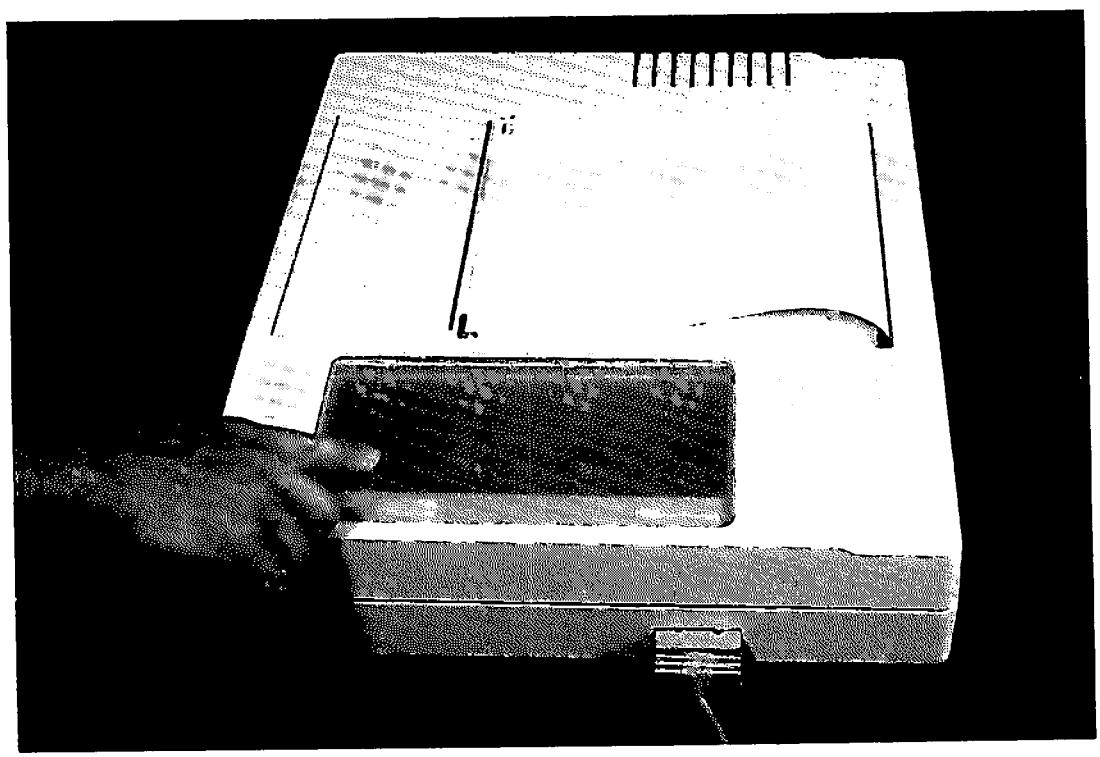


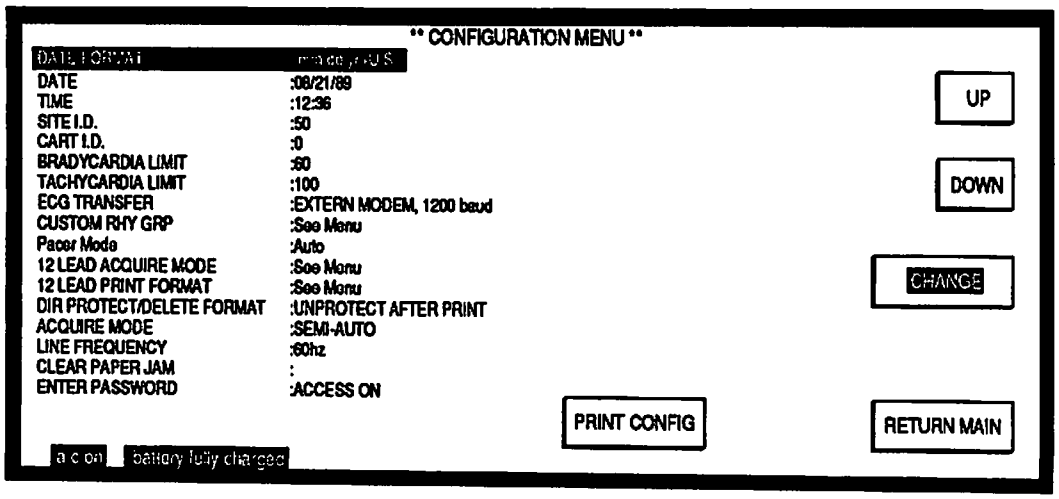
Figure 11
Press Paper Advance Key



CONFIGURING THE E550

If you are using the E550 for the first time, you should configure it before attempting to acquire an ECG. To display the Configuration Menu (Fig. 12), press CONFIGURE from the Main Menu (Fig. 7). This menu lets you set default values for the standard operating parameters. Once these values are set, they remain in memory (even when the power switch is off) until new values are entered again through the Configuration Menu.

Figure 12
Configuration Menu



Refer to Fig. 12 for the following keys:

UP → Moves the highlight bar UP through the data field to select other items.

DOWN → Moves the highlight bar DOWN through the data field to select other items.

CHANGE → Press to CHANGE the highlighted configuration item. This displays the related option screen(s) for the selected item.

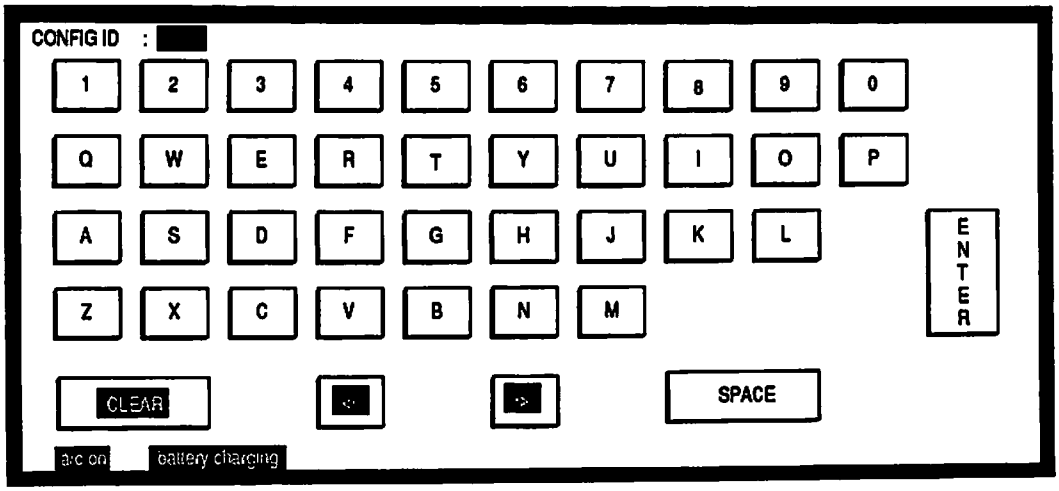
RETURN MAIN → Returns to the Main Menu. If any changes have been made through the Configuration Menu (Fig. 12) during the current editing session, this key is replaced by SAVE CONFIGURATION.

SAVE CONFIGURATION → Displays the Config ID screen (Fig. 13). It consists of an alpha-numeric keypad which allows you to enter initials or an identification number. This maintains a record of who last changed the configuration.

The CLEAR, <—, and —> keys allow you to edit your entry. These keys work similarly for all of the configuration screens.

After making your entry, press ENTER. When the Main Menu (Fig. 7) reappears, the new configuration ID is displayed beneath the CONFIGURE key.

Figure 13
Config ID



Configuration Options

The configuration items are listed at the left of the screen (Fig. 12). To select an item, use UP and DOWN to move the highlight bar. Press CHANGE to display the option screens associated with the selected item.

Note that the option screens vary according to each configuration item. However, ENTER and RETURN CNFIG appear on most of these screens.

ENTER → Accepts current entry and automatically goes to the next item. (The current entry is highlighted in upper left corner of screen.)

RETURN CNFIG → Accepts current entry and returns to Configuration Menu.

The configuration options are as follows:

DATE FORMAT:
Select MM/DD/YR for the United States or DD.MM.YR for Europe (Fig. 14). If you change the date format, the new format will appear in the subsequent outputs for all records.

DATE:
There are three similar option screens for date, each with a numeric key pad. First, Year is displayed in the upper left corner (Fig. 15). Enter a new value or accept the default and press ENTER to continue. Next, Month is displayed. Again, enter a value or accept the default and press ENTER. Repeat this procedure for Day.

Figure 14
Date Format

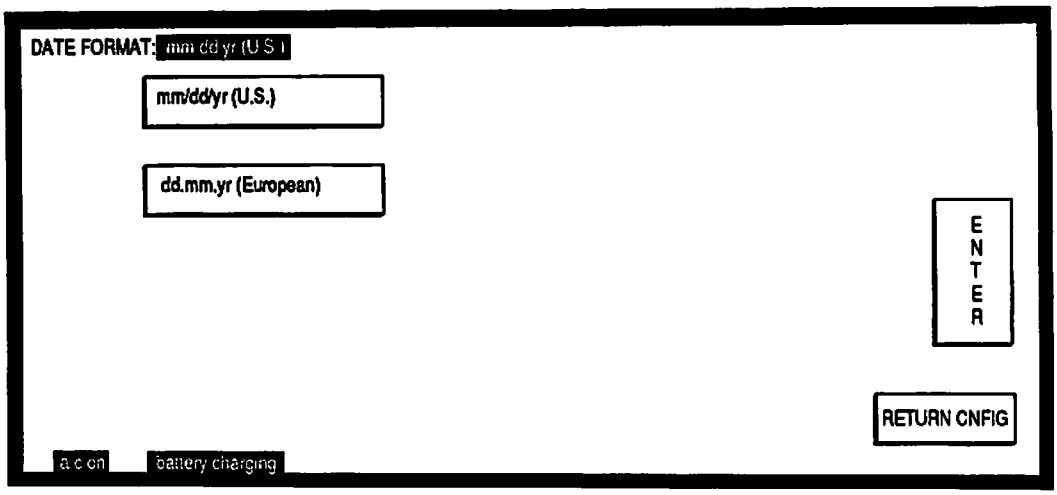
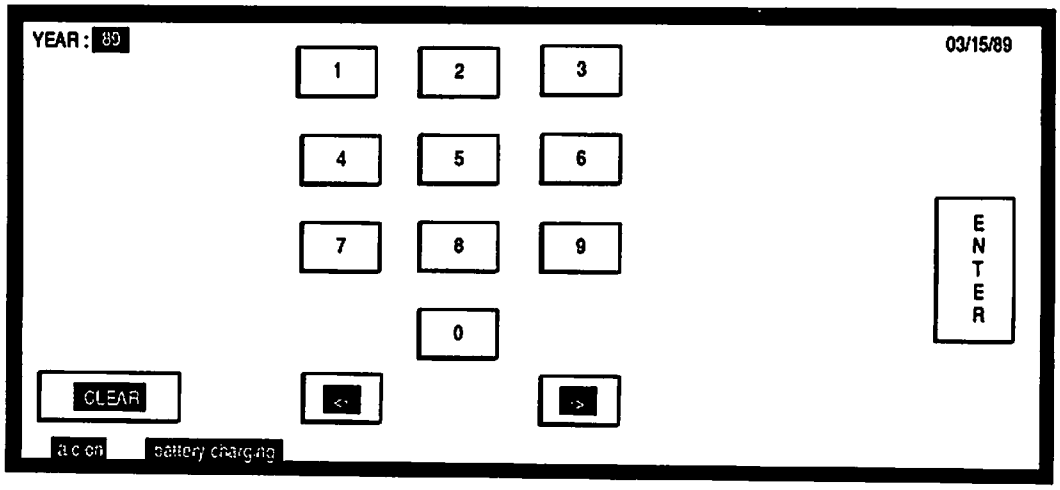


Figure 15
Numeric Keys



TIME:
This is entered in the same way as the date, except the option screens are for Hours, Minutes, and Seconds (refer to Fig. 15). Time always is entered in a 24-hour format.

SITE I.D.:
Numeric keys allow you to enter a site identification number. The site ID is useful for tracking records which have been transmitted or received.

CART I.D.:
Numeric keys allow you to enter a cart identification number. The cart ID is useful for tracking records where multiple electrocardiographs are used.

COPIES/PRINT:
Numeric keys allow you to enter a copy quantity. This number determines how many copies will print whenever printouts are requested. You can override this setting in the manual and semi-auto modes, as well as from the Directory

ECG TRANSFER:

This displays the Serial Device Selection Menu (Fig. 16), allowing you to set up the transfer characteristics. Press DIRECT CONNECT to configure the E550 for a direct connection with an E-Scribe or other Burdick equipment. Press EXTERNAL MODEM to use an external modem (this is the default setting).

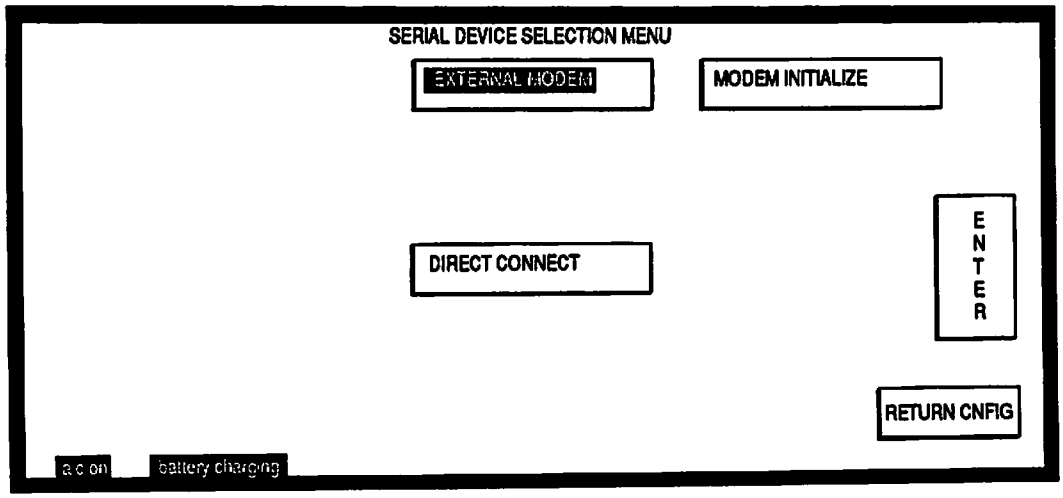


Figure 16
Serial Device Selection Menu

If an external modem is selected, MODEM INITIALIZE appears when you first enter the menu. Press this key to change the modem initialization string (Fig. 17). Normally, changes are not necessary.

☞ *CAUTION: Do not change the modem initialization string unless you are familiar with modem programming. (Refer to your modem operator's manual or Burdick Representative for details.)*

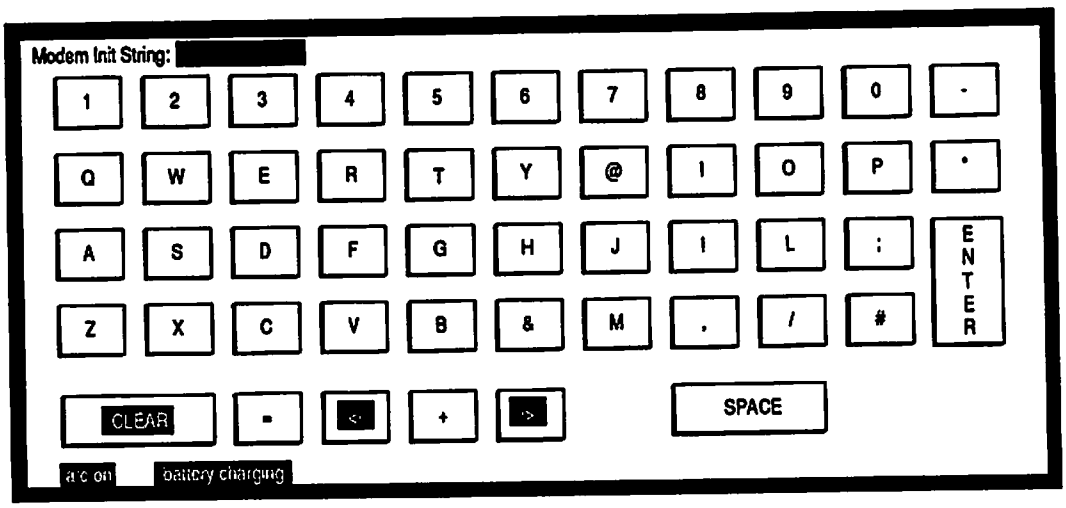


Figure 17
Modem Init String

Initially, the E550 is pre-programmed with initialization strings for the optional Hayes modem. The default string for dialing is at e0 s0=0 x4. For answering, it is at e0 s0=2 x4. In some cases additional parameters may need to be included in the initialization

string. For example, if the phone system is slow to respond, the modem can be instructed to wait longer by changing the initialization string for dialing to: **at e0 s0=0 x4 s7=40.** Since modem programming can be tricky, please consult a Burdick Representative and/or the modem operator's manual before attempting to change the initialization strings.

After you select direct connect or external modem, the Baud Rate Selection Menu appears (Fig. 18). This menu is context sensitive and only displays the appropriate baud rates. If an external modem is selected, the E550 also asks you to enter a phone number (Fig. 19). The special characters shown in Fig. 20 may be entered as part of the telephone number if required. Dashes and spaces are ignored by the modem.

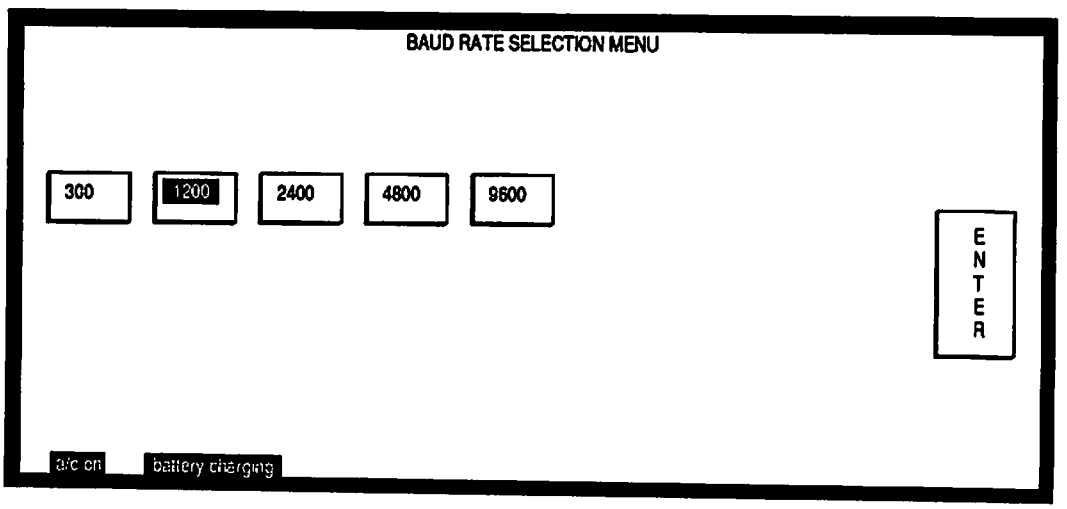


Figure 18
Baud Rate Selection Menu

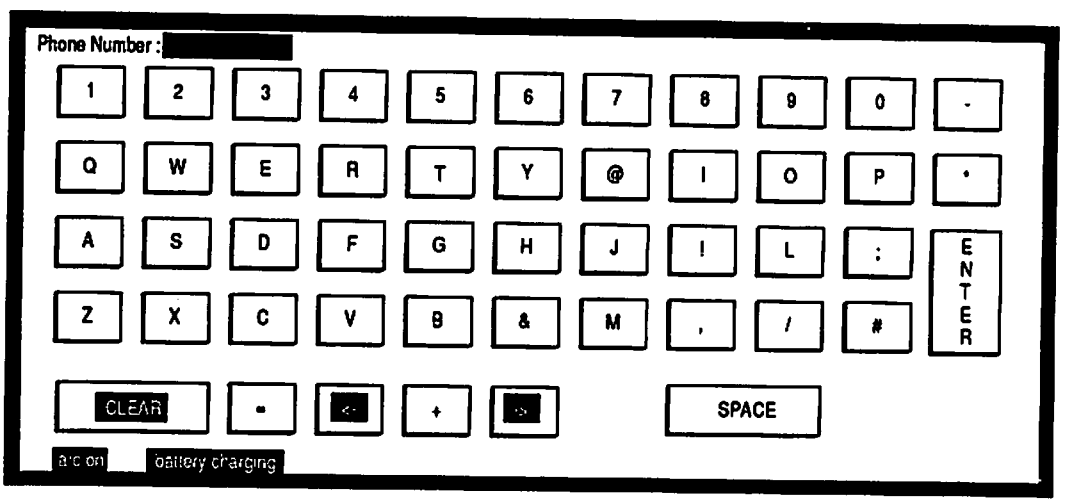


Figure 19
Phone Number

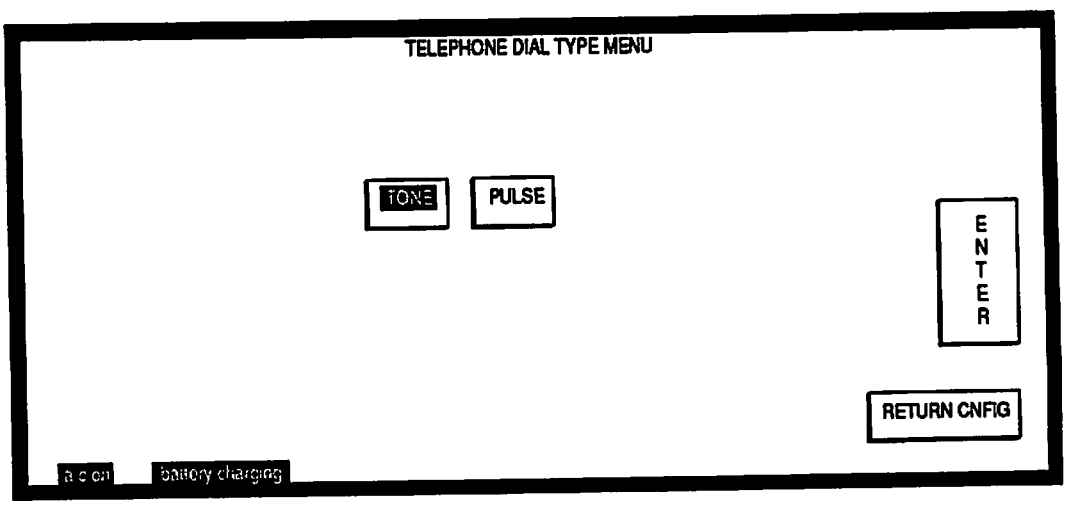
Figure 20
Special Characters

Special Characters for Modem Dialing

, — Pause for 2 seconds
! — Hook-flash
@ — Wait for 5 second silent answer (no dial tone transmitted)
W — Wait for second dial tone
; — Return to command state after dialing
R — Reverse to answer mode (to call an originate-only modem)

Finally, after the baud rate is entered, the Telephone Dial Type Menu appears (Fig. 21). This lets you pick either tone or pulse dialing. Choose TONE if your phone has push-buttons and you hear musical tones when dialing. Choose PULSE if your phone has a rotary dial or if you hear clicks instead of tones when dialing from a push-button phone.

Figure 21
Telephone Dial Type Menu



ECG SEND FORMAT:
This allows you to choose between FULL or SHORT transmission formats (Fig. 22). If the E550 is transmitting to an Elite Electrocardiograph or PC-Scribe system, the Short format is required. Otherwise, use the default setting of Full.

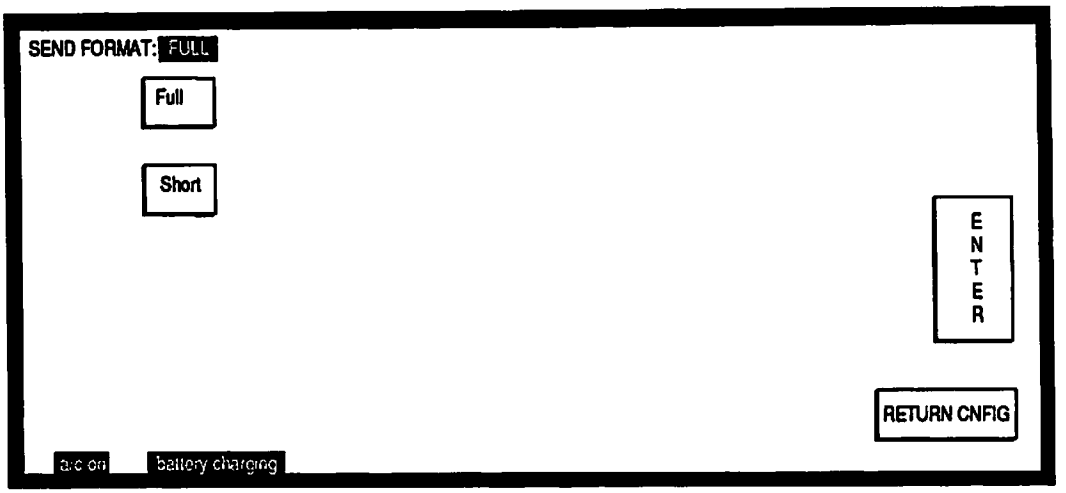


Figure 22
ECG Send Forma

CUSTOM RHY GRP:

This allows you to define up to seven custom rhythm lead groups (Fig. 23). The default group is II, aVF, and V5. You can select a specific lead for each channel. Press the channel keys repeatedly until the desired leads are shown above each key. If a channel is turned off, all the subsequent channels also are turned off. However, channel 1 can not be turned off. Pressing the Next Group key advances to the next rhythm group. Continue until all seven groups are configured as desired.

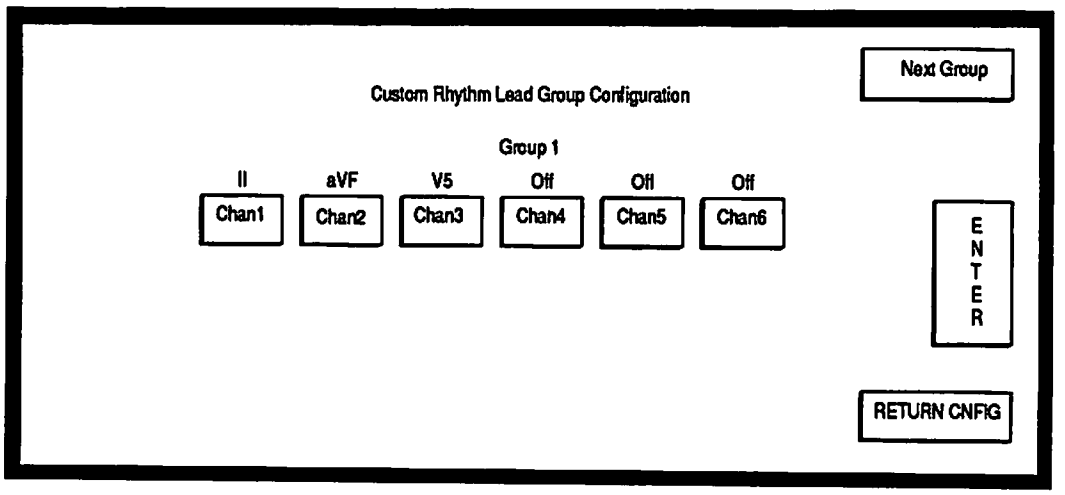


Figure 23
Custom Rhythm Lead Group Configuration

12-LEAD FORMAT:

The 12 -Lead Acquire Setup Menu (Fig. 24) lets you enter the default 12-lead printout format. In the manual and semi-auto modes, you can override the settings.

Under the Print Sequence category, you can turn printing ON or OFF for the waveform, MSR (measurement matrix), and/or average complexes. The E550 provides an alert message if you turn all printing off.

Under the 12-Lead Printout Format category, you may specify a 3-channel, 4-channel, 6-channel 1 page, or 6-channel 2 page printout. For the 4-channel printout, you can select

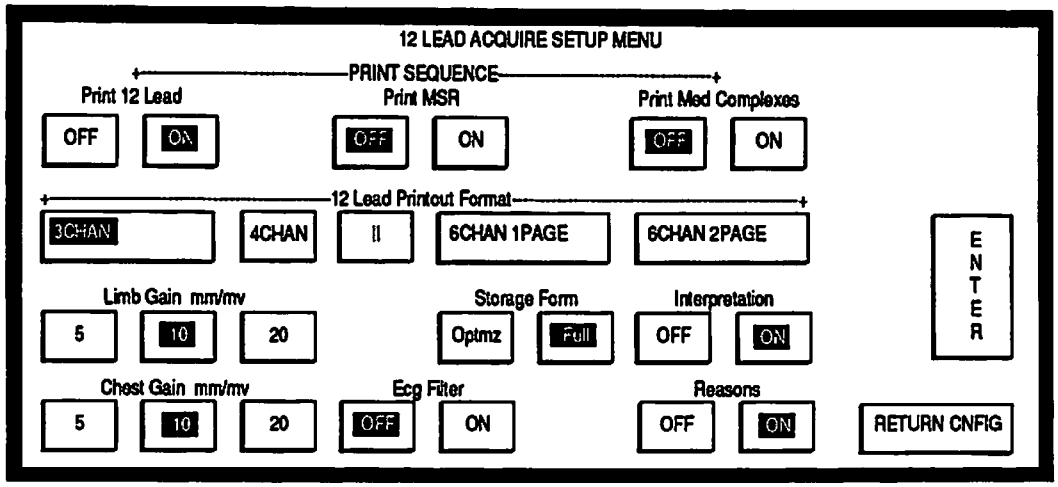


Figure 24
12-Lead Acquire Setup Menu

which lead will be in the fourth channel (default = Lead II). Limb and Chest Gains can be set to 5, 10, or 20 mm/mv. You can turn printing ON or OFF for the Interpretation and Reasons statements. (Refer to the *Physician's Guide* for details on the interpretive statements.) The ECG noise filter also can be turned ON or OFF. The filter setting does not affect the printing of median complexes.

You may specify whether ECG data will be stored in Optmz (optimized) or Full format. In the optimized format, the E550 conserves space by storing only enough data to print records in the same printout format (3-channel, 4-channel, etc.) as they were originally saved; and 4-channel printouts always show Lead II in the fourth channel. Note, however, that in semi-auto and manual modes newly acquired records can be printed in any format *prior* to saving.

In the full format, 10 seconds of data are saved for each lead, allowing you to reproduce any of the printout formats. See Fig. 25 for a summary of the storage formats.

Figure 25
Storage Format Summary

STORAGE FORMATS

PRINTOUT TYPE	OPTIMIZED		FULL	
	Leads	Data	Leads	Data
3CHAN	LIMB	5 SEC	ALL	10 SEC
	CHEST	2.5 SEC	ALL	10 SEC
4CHAN (Lead II)	LEAD II	10 SEC	ALL	10 SEC
	OTHER LIMBS	5 SEC	ALL	10 SEC
	CHEST	2.5 SEC	ALL	10 SEC
4CHAN (any other lead)	ALL	10 SEC	ALL	10 SEC
6CHAN 1PAGE	ALL	5 SEC	ALL	10 SEC
6CHAN 2PAGE	ALL	10 SEC	ALL	10 SEC

DIR UNPROTECT:

There are two types of Directory records: protected and unprotected. Protected records can *not* be overwritten or deleted. Therefore, if the Directory becomes completely filled with protected records, you will not be able to save new ones until some of the protected records are changed to unprotected (see USING THE DIRECTORY).

You can configure the E550 to automatically unprotect records (Fig. 26). UNPROTECT AFTER PRINT automatically unprotects records after they have been printed (this is the default setting). UNPROTECT AFTER SEND automatically unprotects records after they have been transmitted. UNPROTECT AFTER BOTH automatically unprotects records after they have been printed *and* transmitted. AUTO PROTECT ON automatically protects all newly acquired records.

☞ *NOTE: If the Directory becomes full with AUTO PROTECT ON, the current record will be lost. To create more space, manually unprotect additional Directory records.*

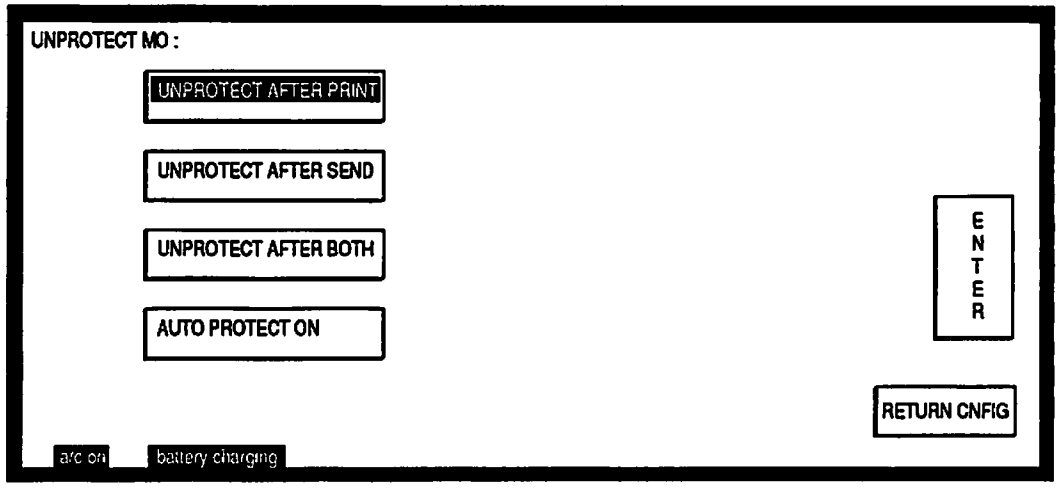


Figure 26
Directory Unprotect Mode

ACQUIRE MODE:

The E550 has three modes for acquiring ECGs: auto, semi-auto, and manual (Fig. 27). AUTO automatically saves and prints the record (this is the default setting). SEMI-AUTO automatically saves the record, but you must initiate the printout. MANUAL allows you to review the ECG, but you must manually initiate the print and save functions. For more details, see ACQUIRING RECORDS.

LINE FREQUENCY:

Configure the E550 for the appropriate line frequency (Fig. 28). Select 60 if your power line frequency is 60Hz (U.S.A.) and 50 if it is 50Hz (Europe). The default is 60Hz.

ENTER PASSWORD:

This field indicates whether or not access is allowed to specific configuration items. If the password protection is disabled (this is the default condition), then the E550 displays

ACCESS ON and any of the configuration items are accessible. On the other hand, if ACCESS OFF is displayed, only those items designated by a colon are accessible. Protected items are designated with an asterix; and a password is required for access.

Figure 27
Acquire Mode

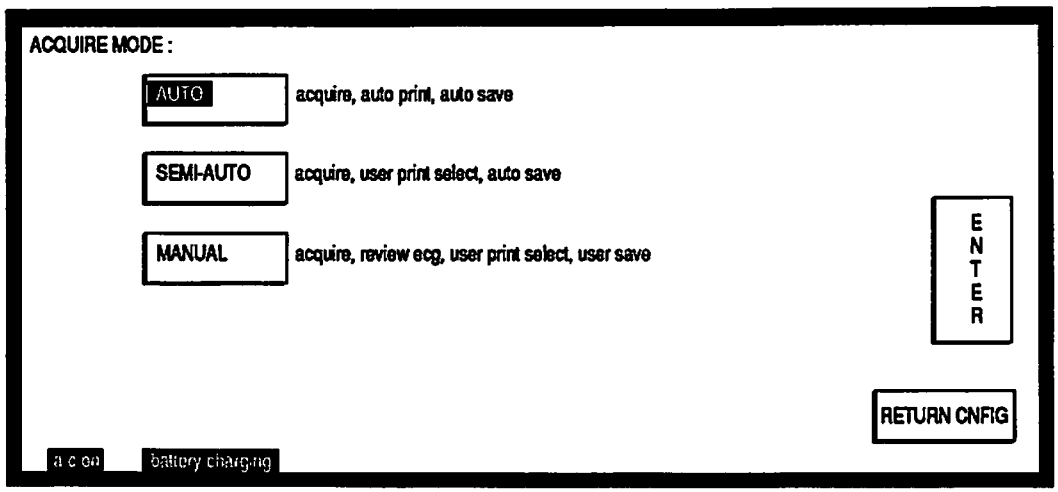
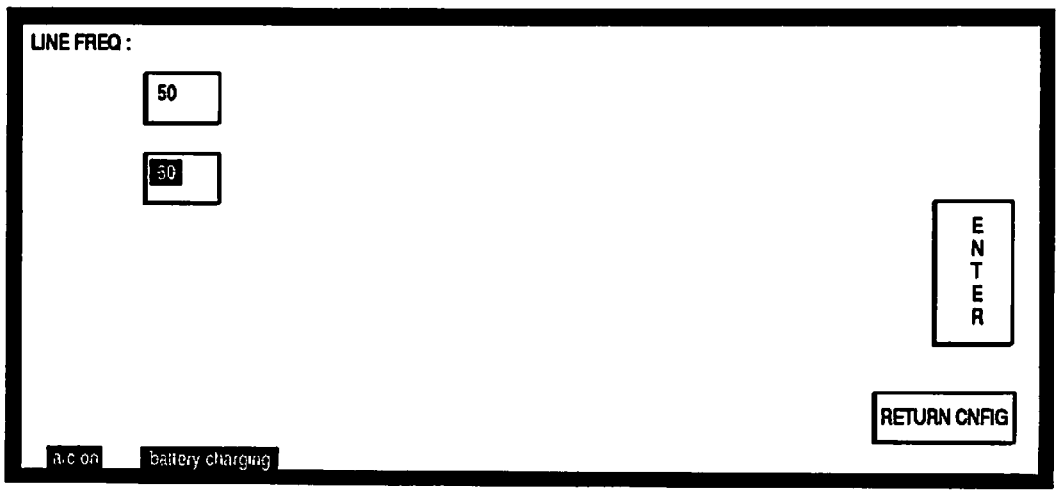


Figure 28
Line Frequency



ENTERING PATIENT DEMOGRAPHICS

Directory records consist of two basic parts: the patient demographic information and the ECG waveform itself. You can enter demographic information according to the standard headings, or use custom headings which have been transferred from an E-Scribe ECG Management System (see TRANSFERRING RECORDS).

When you press ACQUIRE ECG from the Main Menu or Directory, the patient identification menu appears. It also appears when you select EDIT ID from the Directory. If demographic information is being entered for the first time, this menu is titled New Patient Entry Menu (Fig. 29). For existing records, this same menu is titled Edit Directory Patient (Fig. 30).

Figure 29
New Patient Entry Menu

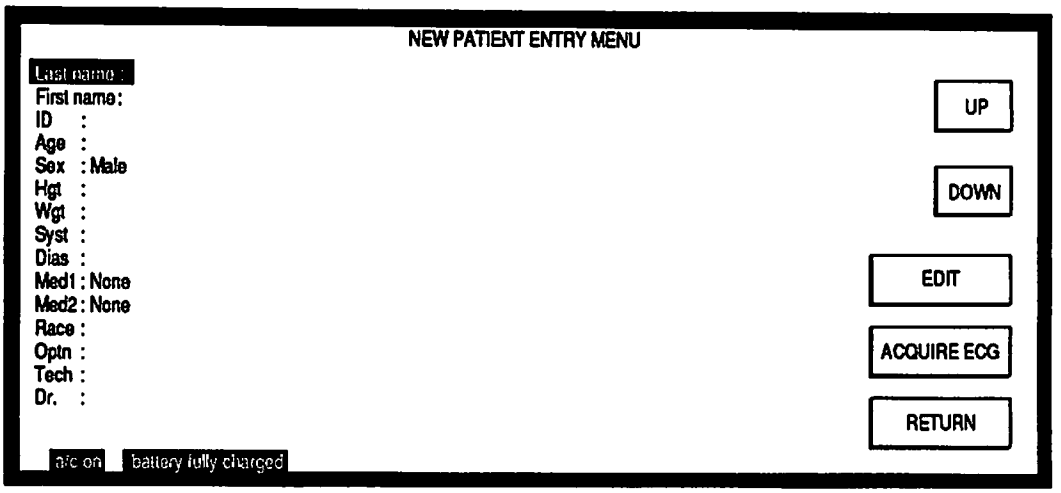
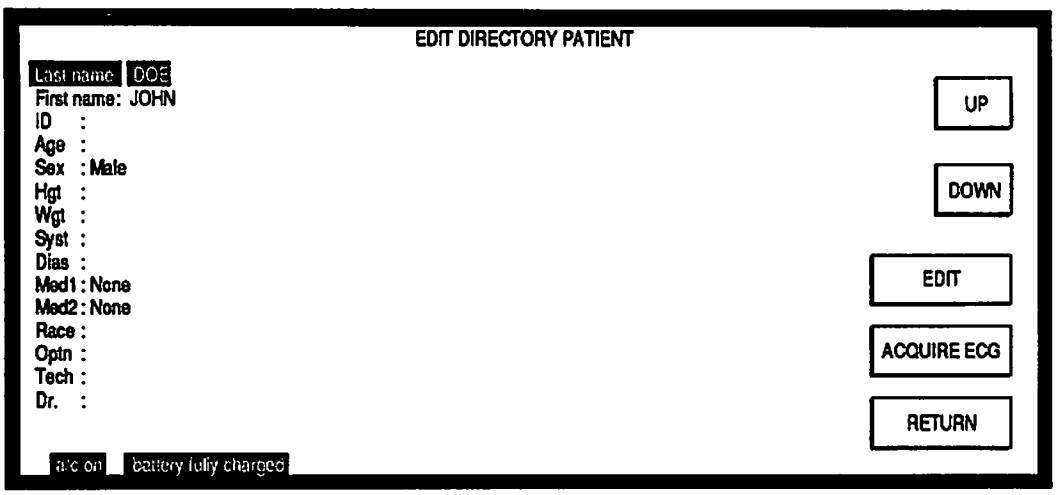


Figure 30
Edit Directory Patient



The patient identification menu (Figs. 29 and 30) has the following keys:

UP → Moves the highlight bar UP (or backward) through the data field to select other items.

DOWN → Moves the highlight bar DOWN (or forward) through the data field to select other items.

EDIT → Edits the highlighted item.

ACQUIRE ECG → Displays the Preview-Acquire Menu. See ACQUIRING RECORDS (Fig. 38).

RETURN → Saves the current patient demographics and returns to either the Directory or Main Menu, depending upon the point of origin. Note that records must have at least a name or identification number, otherwise they will *not* be saved in the Directory.

☞ *TIP: You can save time by entering the patient demographics ahead of time. .*

Standard Headings

The standard demographic headings are listed at the left of the screen (Figs. 29 and 30). To select an item, use UP and DOWN to move the highlight bar. Press EDIT to display the option screens associated with the selected item. The option screens vary according to each item. However, ENTER and RETURN ID appear on most of these screens.

ENTER → Accepts current entry and automatically goes to the next item. (The current entry is displayed in upper left corner of screen.)

RETURN ID → Accepts current entry and returns to the patient identification menu.

The standard demographic headings are as follows:

Last name:

Use the alpha-numeric keys (Fig. 31) to enter the patient's last name. The CLEAR, <—, and —> keys allow you to edit your entry. These keys work similarly for all of the patient data screens. The record will *not* be saved unless a name or identification number is entered.

First name:

Use the alpha-numeric keys (Fig. 31) to enter the patient's first name. The CLEAR, <—, and —> keys allow you to edit your entry. These keys work similarly for all of the patient data screens. The record will *not* be saved unless a name or identification number is entered.

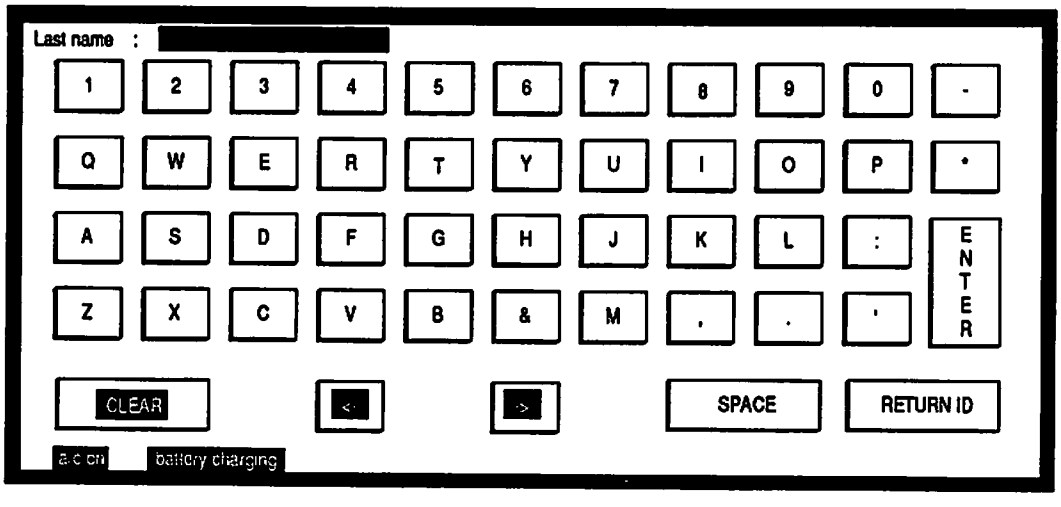
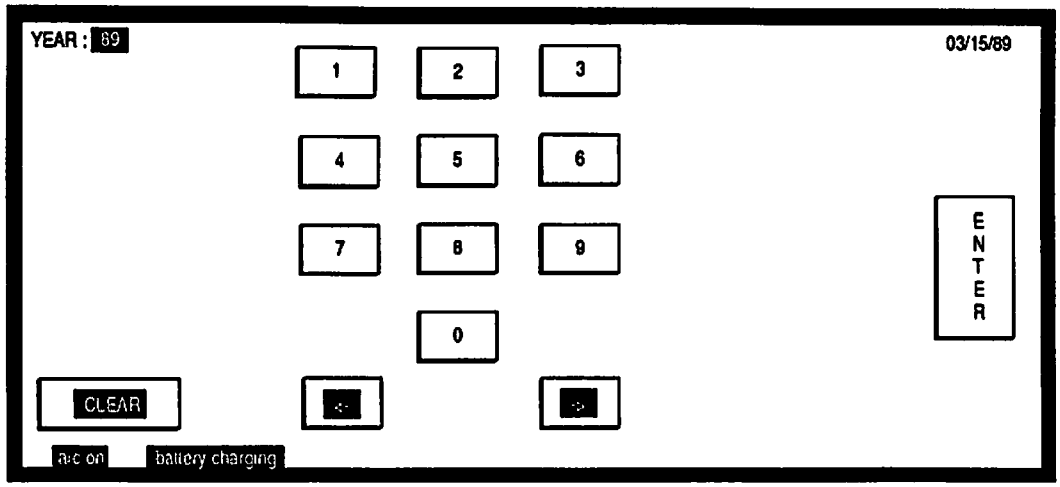


Figure 31 *Alpha-numeric Keys*

ID:

Use the numeric keys (Fig. 32) to enter the patient's identification number. The record will *not* be saved unless a name or identification number is entered.

Figure 32
Numeric Keys



Age:

Use the numeric keys (Fig. 32) to enter the patient's age. If the age is not entered, the E550's analysis assumes an age of 26 years.

Sex:

Select either MALE or FEMALE (Fig. 33). The default is male.

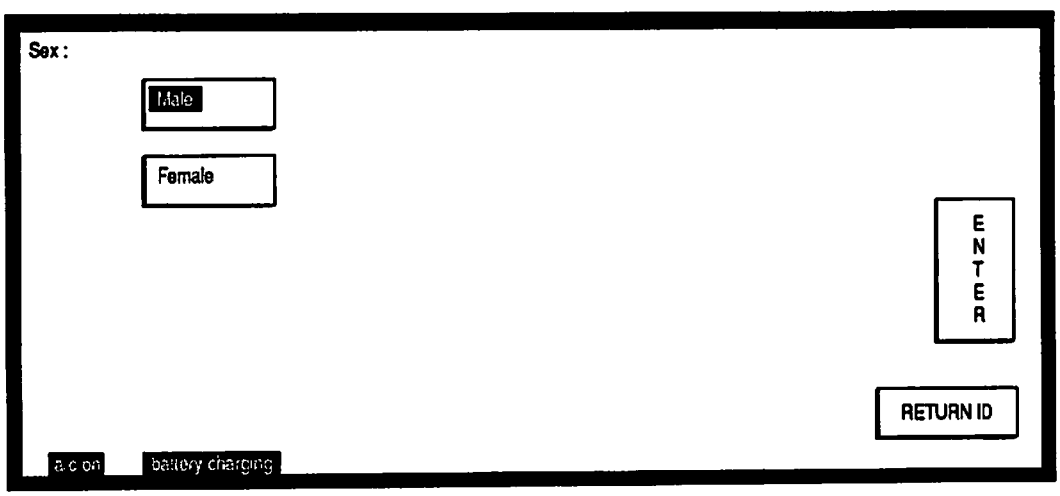
Hgt:

Use the numeric keys (Fig. 32) to enter the patient's height.

Wgt:

Use the numeric keys (Fig. 32) to enter the patient's weight.

Figure 33
Sex



Syst:
Use the numeric keys (Fig. 32) to enter the patient's systolic blood pressure.

Dias:
Use the numeric keys (Fig. 32) to enter the patient's diastolic blood pressure.

Med1:
Select one of the following: NONE, DIGITALIS, BETA BLOCKER, QUINIDINE/ NORPACE, DIURETIC, CALCIUM ANTAGONIST, PROC/LIDO/TOCAINIDE, OTHER ANTIARRHYTHMIC, PSYCHOTROPIC, OR UNKNOWN (Fig. 34). The current selection is highlighted (default = none).

Med2:
This lets you enter a second medication if applicable (Fig. 34). The selections are the same as for Med1.

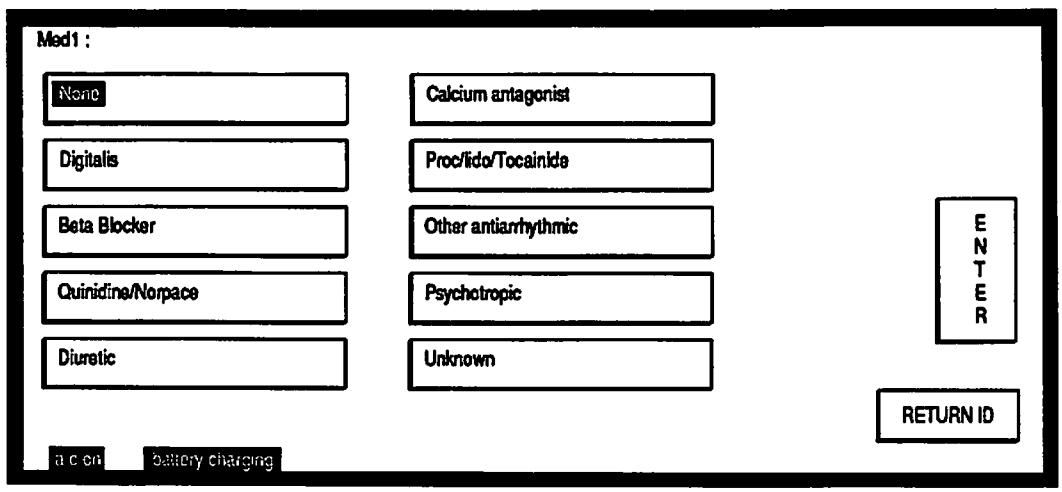


Figure 34
Medications

Race:
Select BLACK, CAUCASIAN, HISPANIC, ORIENTAL, or the blank key (Fig. 35). The default is blank.

Optn:
Use the alpha-numeric keys (Fig. 36) to enter any optional comments or notes.

Tech:
Use the alpha-numeric keys (Fig. 36) to enter the technician's name. For convenience, this entry will stay in memory for all subsequent records until changed again.

Dr.:
Use the alpha-numeric keys (Fig. 36) to enter the doctor's name. For convenience, this entry will stay in memory for all subsequent records until changed again.

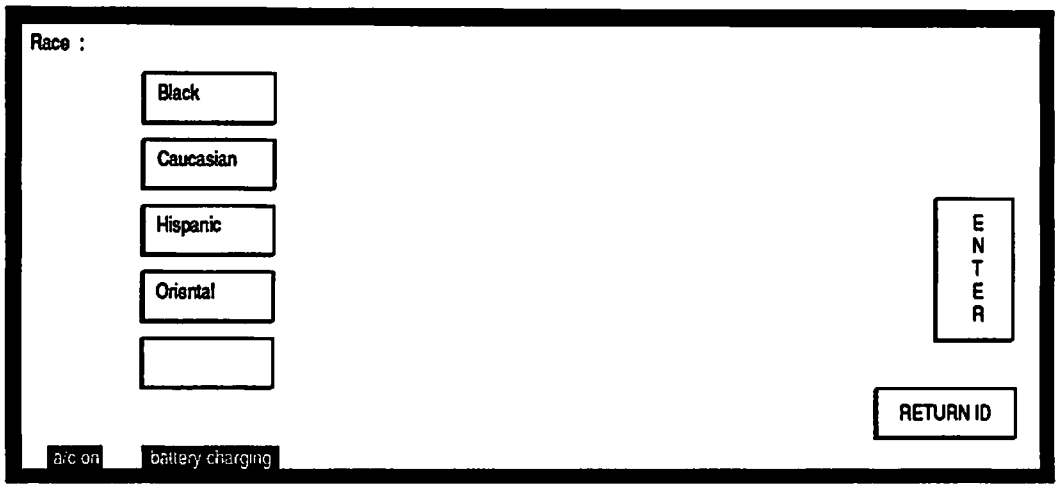


Figure 35
Race

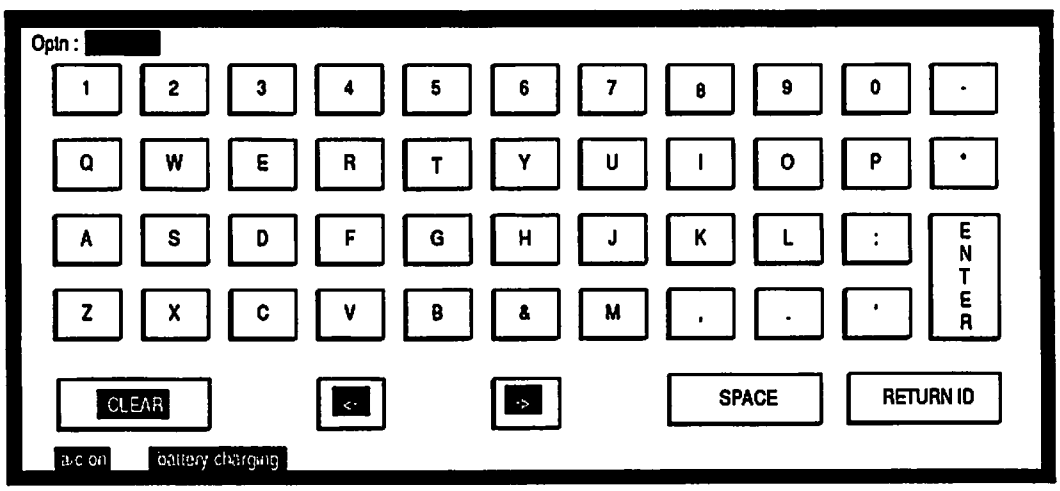


Figure 36
Option, Technician, Doctor

Custom Headings

You can use custom headings which have been transferred from the E-Scribe ECG Management System (see TRANSFERRING RECORDS). At a minimum, customized demographic headings consist of the name, identification number, age, and sex. The order and location of custom headings are determined by the E-Scribe (see *Operator's Manual* for details). Fig. 37 shows how a custom header might look.

☞ *WARNING — If you download custom headers and then wish to return to the standard headings, a special procedure must be performed by your Burdick Service Representative to restore the defaults.*

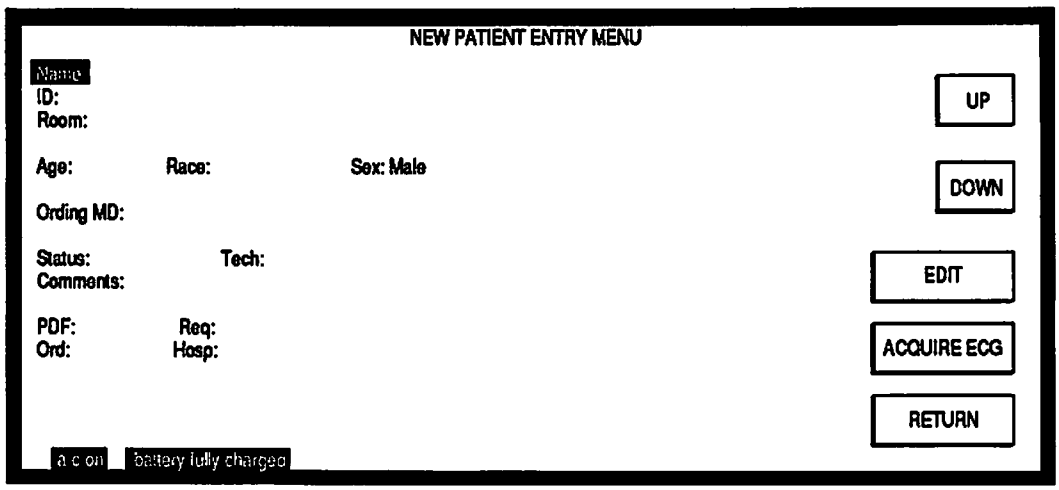


Figure 37
Sample Custom Header

ACQUIRING RECORDS

The E550 has three ECG acquisition modes. The active mode is determined during configuration (see CONFIGURING THE E550). These modes allow for various levels of automation:

- **AUTO** Acquire, then automatic print and save. (default mode)
- **SEMI-AUTO** Acquire and select printout, then automatic save.
- **MANUAL** Acquire, review, select printout, and save. (no automatic actions)

You can acquire an ECG quickly by pressing the STAT ECG key from the Main Menu. This will acquire an ECG in the auto mode, regardless of the current setting. The record is saved in the Directory with a patient name of "stat". Also, the E550 creates an identification number consisting of the date and time.

STAT ECG → Quickly acquires, prints, and saves a record in the Directory. The patient demographics screens are bypassed. The E550 returns to the Directory upon completion.

Most of the time, you will acquire an ECG in the standard manner by pressing ACQUIRE ECG from the Main Menu or Directory. This causes the patient identification menu to appear (Figs. 29 and 30), giving you an opportunity to enter or edit the patient demographics. You may do this before *or* after the acquisition.

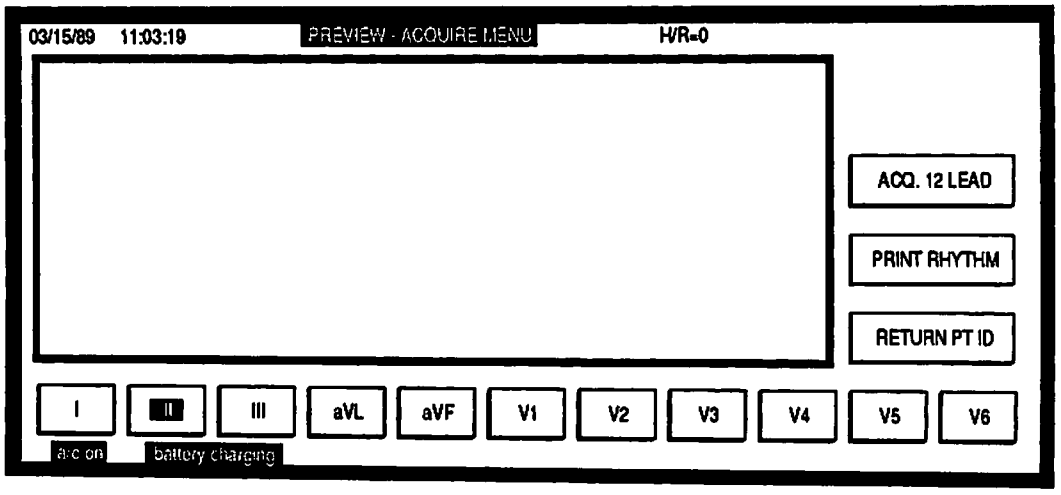
Press ACQUIRE ECG again from the patient identification menu to proceed with the acquisition. This displays the Preview - Acquire Menu.

Preview - Acquire Menu

The Preview - Acquire Menu (Fig. 38) shows the ECG waveform and heart rate. You may select and display individual lead groups before acquiring the ECG.

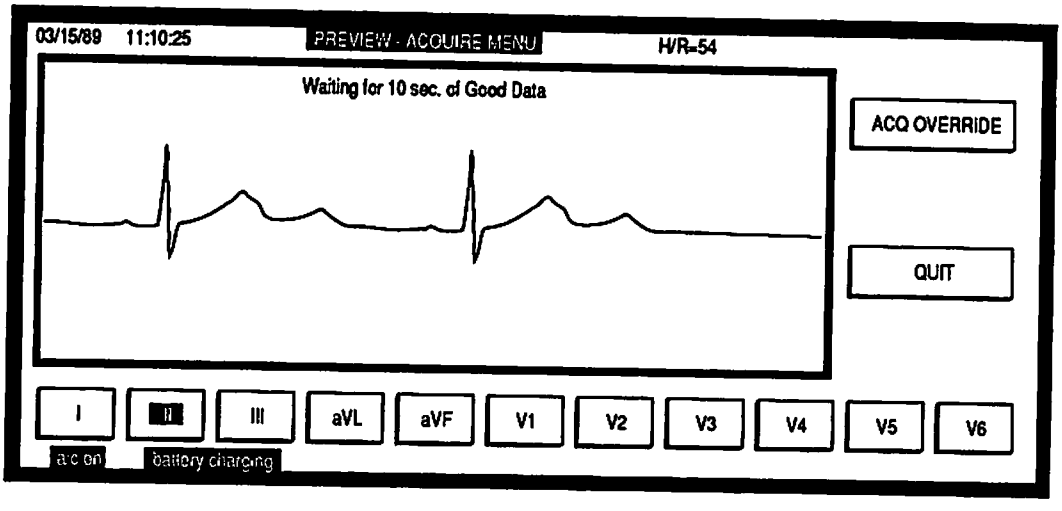
☞ *NOTE: Displayed waveforms are for reference only and not intended for diagnostic use. If poor data is detected, "noisy", "fail", or "drift" appears above the offending lead(s). If more than one V-lead is off, pacer enhancement is inhibited.*

Figure 38
Preview-Acquire Menu



ACQ. 12 LEAD → Acquires a 12-lead ECG. At first, the message "Waiting for 10 Sec. of Good Data" appears (Fig. 39). The E550 waits for at least 10 seconds of data without lead failures or noise before acquiring the ECG. You can override this by pressing ACQ OVERRIDE. Press QUIT to abort the acquisition.

Figure 39
Waiting for 10 Seconds of Good Data



PRINT RHYTHM → Displays a menu to select the lead group, chest and limb gains, writer speed, and filter on/off settings for the rhythm strip (see PRINTOUTS). This key appears *only* when the AC power switch is ON.

RETURN PT ID → Returns to the patient identification menu (Figs. 29 and 30).

[ ] → Selects the corresponding lead for display. (I, II, III, aVL, aVF, V1..V6)

Auto Acquisition

To acquire an ECG in auto mode, press ACQ. 12 LEAD from the Preview - Acquire Menu. The E550 will acquire the record and display the message "Waiting for analysis to complete" (Fig. 40). If the E550 is configured for printouts, the "Waiting for printout(s) to complete" screen is displayed next (Fig. 41).

If patient demographics have not been entered, the patient identification menu appears with a warning that the record will *not* be saved if a Name or ID# is not entered. (Refer to Fig. 29 and ENTERING PATIENT DEMOGRAPHICS). After you have entered patient demographics, the RETURN key changes to SAVE RECORD. Press this key to save the record.

Next, the "Waiting for completion of save" screen is displayed (Fig. 43). Upon completion, the E550 returns to the Directory with the new record highlighted at the top of the list.

Figure 40 *Waiting for Analysis to Complete*

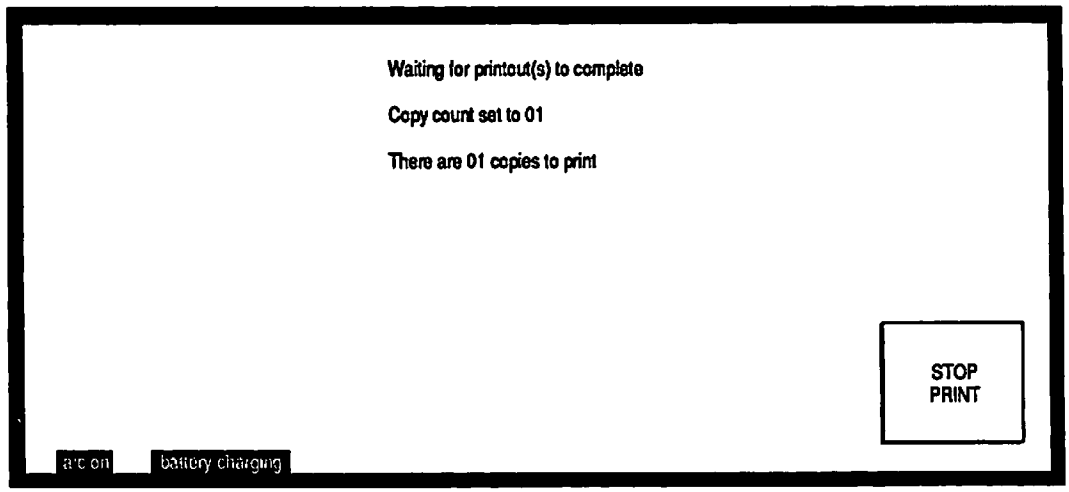


Figure 41 *Waiting for Printout(s) to Complete*

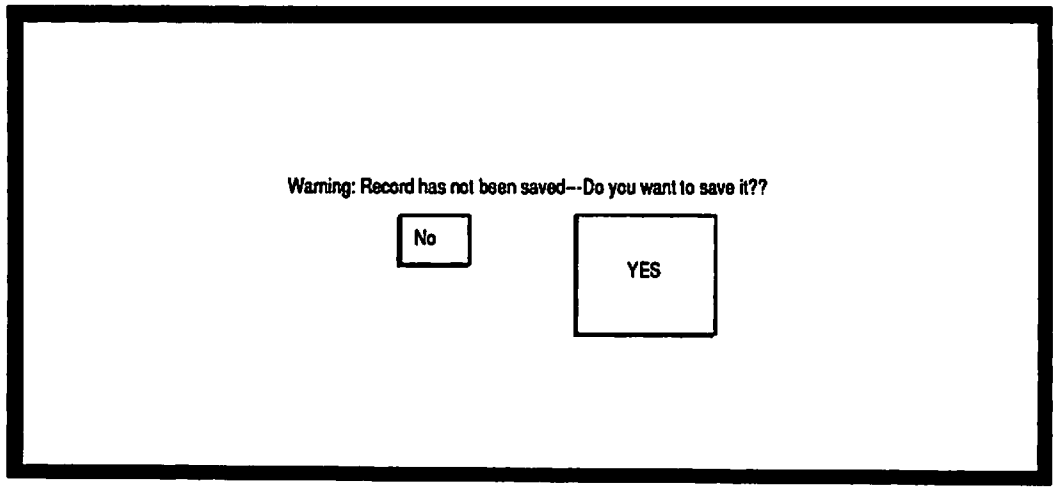


Figure 42 *Second Chance to Save Record*

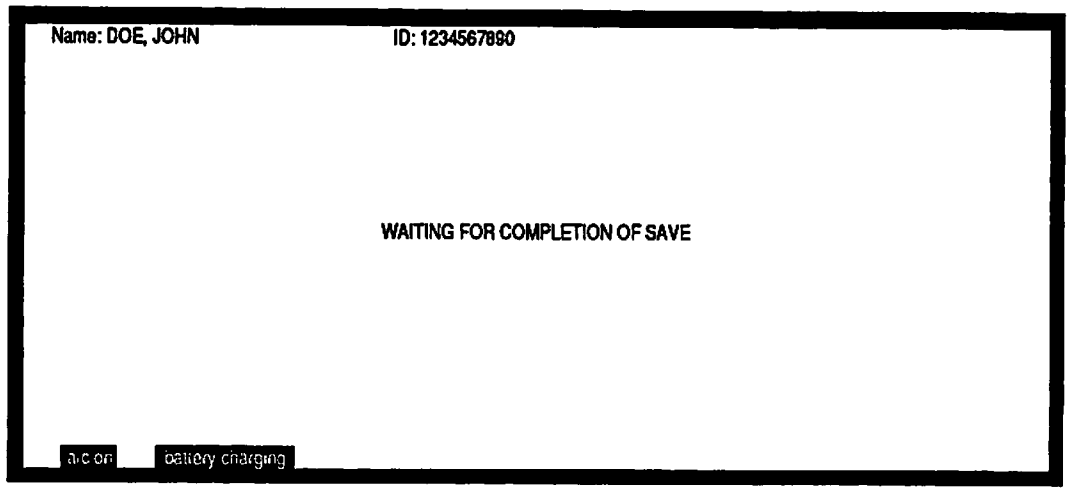


Figure 43 *Waiting for Completion of Save*

Semi-Auto Acquisition

To acquire an ECG in semi-auto mode, press ACQ. 12 LEAD from the Preview - Acquire Menu. The E550 will acquire the record and display the message "Waiting for analysis to complete" (Fig. 40).

Then, the Manual Print Menu appears (see PRINTOUTS). Make the desired selections and press START PRINT to begin the printing. Next, you will see the "Waiting for printout(s) to complete" screen (Fig. 41). Upon completion, the Manual Print Menu returns. Press SAVE RECORD to exit.

Next, the "Waiting for completion of save" screen is displayed (Fig. 43). Upon completion, the E550 returns to the Directory with the new record highlighted at the top of the list. Note that if patient demographics have not been entered, the patient identification menu appears (as previously described) before the record is saved.

Manual Acquisition

To acquire an ECG in manual mode, press ACQ. 12 LEAD from the Preview - Acquire Menu. The E550 will acquire the record and display the message "Waiting for analysis to complete" (Fig. 40).

When complete, the Limb Median Complexes menu is displayed (Fig. 45). From this menu, you have access to all the print and review options (see REVIEWING RECORDS).

If PRINT is selected, the Manual Print Menu appears (see PRINTOUTS). Make the desired selections and press START PRINT to begin the printing. Next, you will see the "Waiting for printout(s) to complete" screen (Fig. 41). Upon completion, the Manual Print Menu returns. If QUIT REVIEW is pressed, the E550 gives you a second chance to save the record before exiting (Fig. 42).

If SAVE RECORD is selected, the "Waiting for completion of save" screen is displayed (Fig. 43). Upon completion, the E550 returns to the Directory with the new record highlighted at the top of the list. Note that if patient demographics have not been entered, the patient identification menu appears (as previously described) before the record is saved.

REVIEWING RECORDS

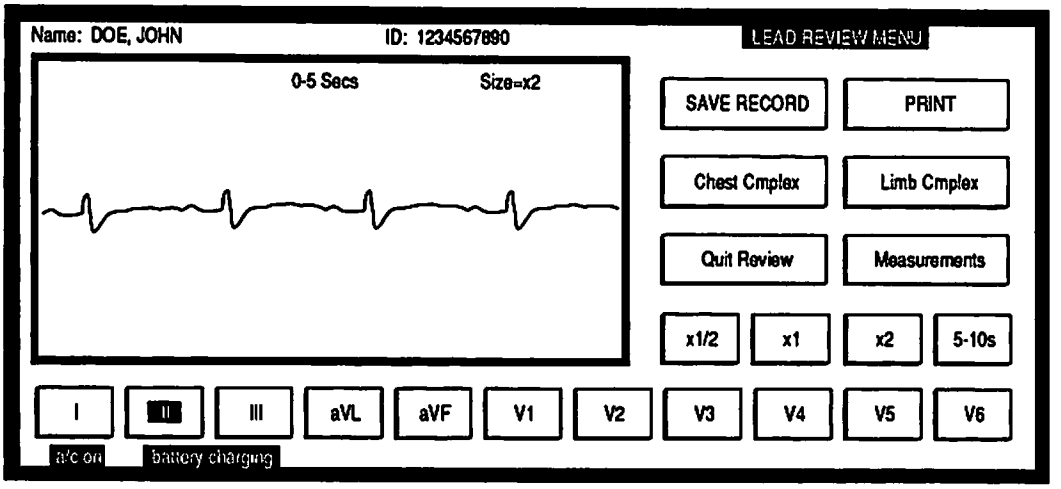
When you acquire records in manual mode, the E550 automatically displays the Limb Median Complexes menu (Fig. 45). This menu is linked to other menus which allow you to review, print, and save the waveforms.

Lead Review Menu

The main review menu is the Lead Review Menu (Fig. 44). To access this menu, press LEADS from the Limb Median Complexes menu (Fig. 45), or REVIEW ECG from the Directory (see USING THE DIRECTORY).

☞ *NOTE: The displayed waveforms are for reference only and not intended for diagnostic use.*

Figure 44 *Lead Review Menu*



Refer to Fig. 44 for the following keys:

x1/2 x1 x2 → Selects the gain for the displayed waveform. (x1/2, x1, x2)

5-10s → Toggles the display between the first and second halves of the waveform. Select 0-5s to display the first five seconds of data. Select 5-10s to display the last five seconds of data.

II → Selects the corresponding lead for display. (I, II, III, aVL, aVF, V1..V6)

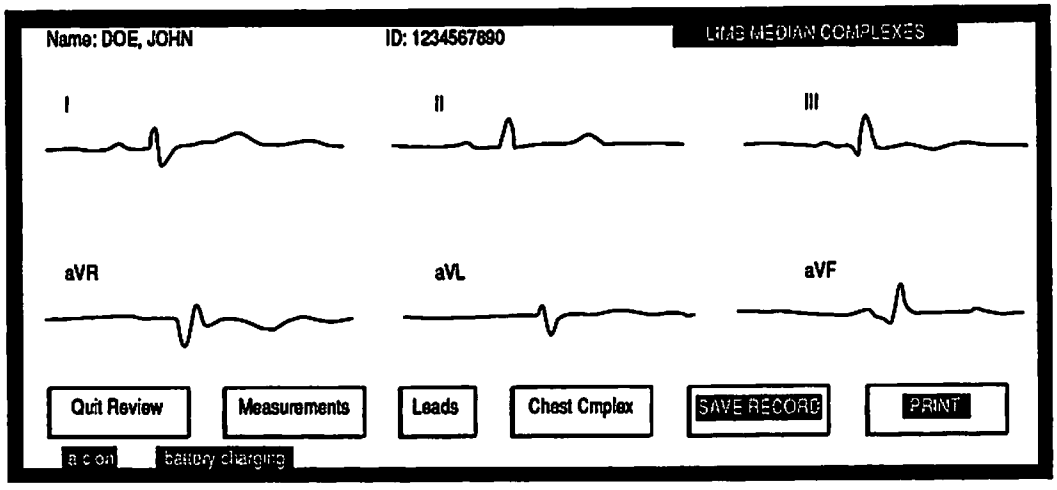
These keys work similarly for all of the review menus (Figs. 45-47):

SAVE RECORD → Saves the acquired ECG in the Directory. If patient demographics have not been entered, the patient identification menu appears (see previous discussion under Auto Acquisition).

PRINT → Displays the Manual Print Menu (see PRINTOUTS). Printing is available only when the AC power switch is ON.

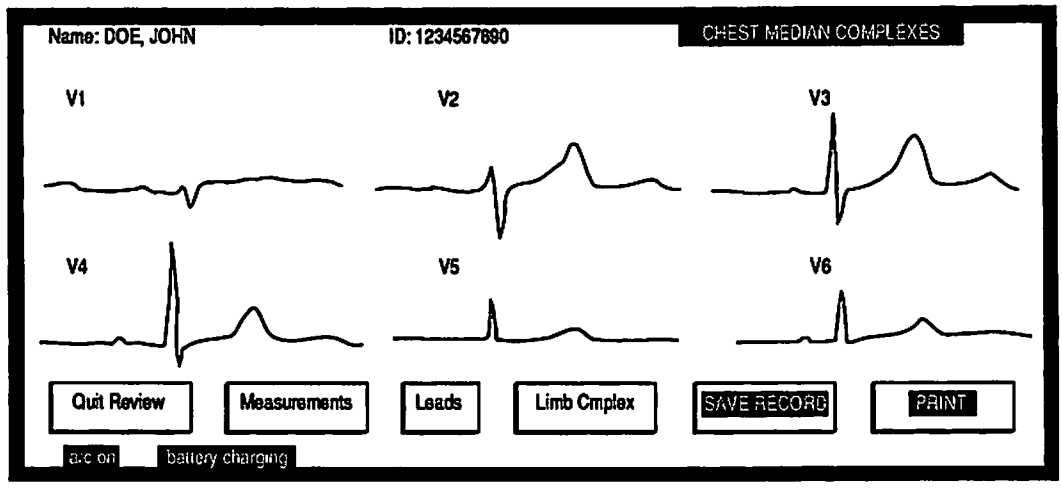
Limb Cmplex → Displays the Limb Median Complexes menu (Fig. 45).

Figure 45
Limb Median Complexes



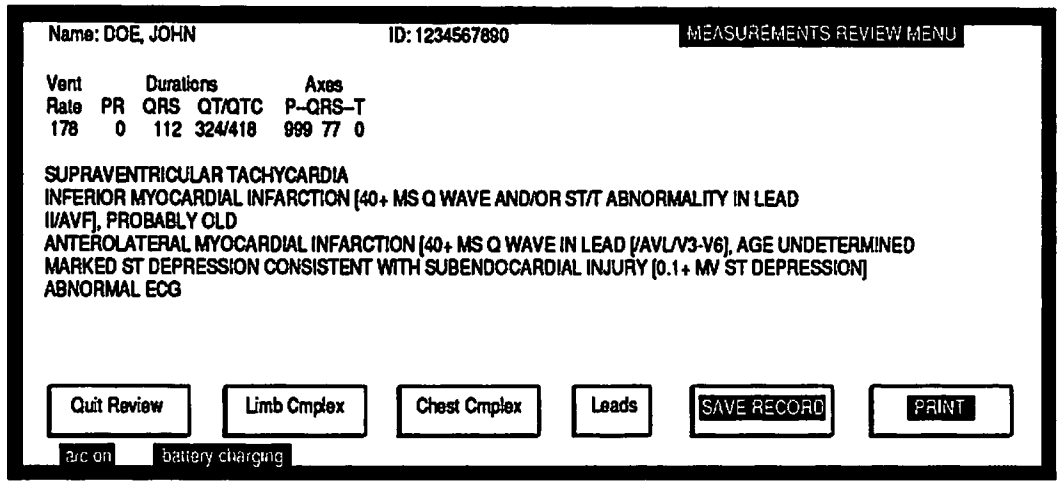
Chest Cmplex → Displays the Chest Median Complexes menu (Fig. 46).

Figure 46
Chest Median Complexes



Measurements → Displays the Measurements Review Menu (Fig. 47). This allows you to view the measurements, analysis, and reasons statements. Analysis and reasons statements only appear if the E550 is configured to display them (see CONFIGURING THE E550). Reasons statements appear in brackets. Refer to the *Physician's Guide* for complete details on the interpretive statements.

Figure 47
Measurements Review Menu


Name: DOE, JOHN
ID: 1234567890
MEASUREMENTS REVIEW MENU
Vent Rate PR Durations QRS QT/QTC Axes P-QRS-T
178 0 112 324/418 999 77 0
SUPRAVENTRICULAR TACHYCARDIA
INFERIOR MYOCARDIAL INFARCTION [40+ MS Q WAVE AND/OR ST/T ABNORMALITY IN LEAD II/AVF], PROBABLY OLD
ANTEROLATERAL MYOCARDIAL INFARCTION [40+ MS Q WAVE IN LEAD [/AVL/V3-V6], AGE UNDETERMINED
MARKED ST DEPRESSION CONSISTENT WITH SUBENDOCARDIAL INJURY [0.1+ MV ST DEPRESSION]
ABNORMAL ECG
Quit Review
Limb Cmplex
Chest Cmplex
Leads
SAVE RECORD
PRINT
a/c on
battery charging

Leads → Returns to the Lead Review Menu (Fig. 44).

Quit Review → Returns to the Preview - Acquire Menu (Fig. 38) or the Directory, depending upon the point of origin. If the record has not been saved, the E550 gives you a second chance to do so before exiting (Fig. 42).

USING THE DIRECTORY

The Directory provides a listing of all the patient records stored in memory. This listing includes the patient's name, identification number, date, time, and ECG type. (Note that the current selection always remains at the top of the list.) The Directory tells you whether a record has been printed, transmitted, or received by placing an "X" under the appropriate column.

To access the Directory, press DIRECTORY from the Main Menu (Fig. 7). Use these keys to navigate (see Fig. 48):

UP → Scrolls the entries UP.

DOWN → Scrolls the entries DOWN.

PgUp → Scrolls up one screen page. (Only appears when there are more than 12 entries and you have pressed UP.)

PgDn → Scrolls down one screen page. (Only appears when there are more than 12 entries and you have pressed DOWN.)

RETURN MAIN → Returns to the Main Menu.

☞ *NOTE: Because the keys are context-sensitive, only those which apply to the current situation are displayed.*

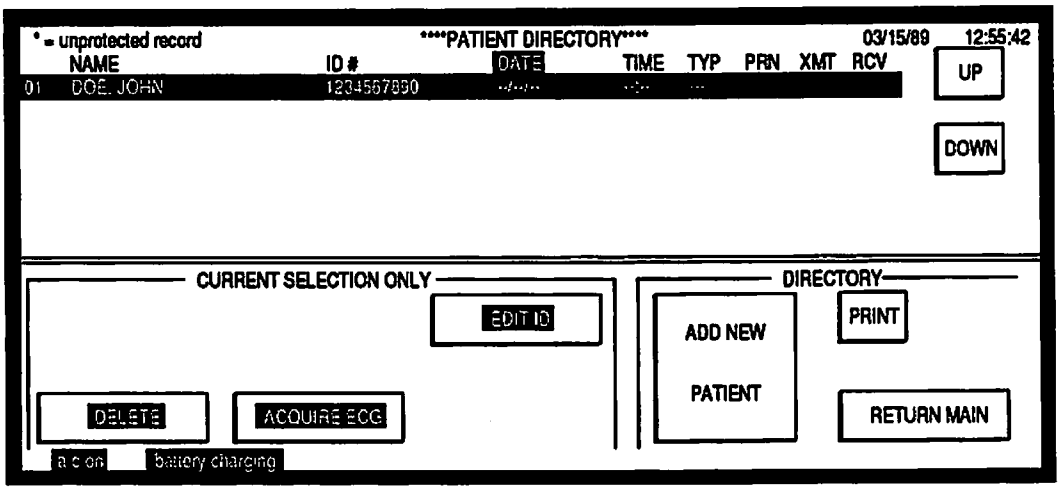


Figure 48
Directory

Main Functions

The Directory is very flexible, allowing access to all of the basic functions. This includes acquiring, editing, reviewing, printing, and transferring records.

Refer to Fig. 48 for these keys:

ADD NEW PATIENT → Displays the New Patient Entry Menu (see ENTERING PATIENT DEMOGRAPHICS). Use this key when you want to add a new record to the Directory.

EDIT ID → Displays the Edit Directory Patient Menu (see ENTERING PATIENT DEMOGRAPHICS). Use this key when you want to change a Directory record.

ACQUIRE ECG → If there is no ECG for the current record, the Preview - Acquire Menu appears. This allows you to add an ECG to the current record.

If there already is an ECG for the current record, the New Patient Entry Menu appears. This allows you to use the existing patient demographics to generate an additional record.

(Refer to ENTERING PATIENT DEMOGRAPHICS and ACQUIRING RECORDS.)

☞ *TIP: You can save time by entering the patient demographics ahead of time.*

SIEMENS

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SIMPLIFYING YOUR SERVICE NEEDS: Service Contract Options

SIEMENS BURDICK, INC.
15 Plumb Street, Milton, WI 53563

Publication No. 086055

Revised: Sept. 1991

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- Factory-approved assistance and planned maintenance is done only by Siemens Burdick-trained technicians.

BURDICK UPTIME™ is your best protection against high-priced repairs

- Guarantees your instrument will receive the most skilled attention at the lowest possible cost.
- One small annual fee protects your Siemens Burdick equipment against service and/or parts cost for a full year.
- Consider the high cost of a one-time repair. If your UPTIME covered instrument requires attention just once during the year, you're already dollars ahead.

BURDICK UPTIME™ is your best protection against equipment frustration

- Siemens Burdick has made a major commitment to provide the resources you need to keep your equipment functional.
- No time lost searching for appropriate repair facilities or parts availabilities.
- A factory trained service technician will be working on your instrument.
- Optional loaners are available in most instances to keep your facility functioning.

BURDICK

UPTIME™

Siemens Burdick offers these service options to better meet your specific needs

1 AND 2 — PERSONAL ON-SITE SERVICE*

WHAT YOU DO
- Call **800-333-7770** 608-868-4678
- Ask for "Technical Service Support"

WHAT YOU RECEIVE
- On-site, next-day service by local technicians
- Instrument inspected and repaired***
- Performance inspections and documentation

TYPE 1: Service 8 A.M. to 5 P.M. Monday thru Friday**
TYPE 2: Service 24 hours a day, 7 days a week**

WHAT YOU GAIN
- Extended product life
- Minimal downtime
- Increased reliability
- Easy budgeting
- One-time invoicing
- Reduced service cost

3 AND 4 — DIRECT-TO-SIEMENS BURDICK SERVICE

- Call **800-333-7770** 608-868-4678
- Ask for "Technical Service Support" and inquire about shipping instructions

- Instrument inspected and repaired by factory-trained service technicians
- Complete performance inspection that the instrument meets factory performance criteria
- 3-day return shipping
- Free return shipping

TYPE 3: Mail-in direct to Siemens Burdick
TYPE 4: Mail-in direct to Siemens Burdick and receive free use of loaner equipment while your unit is in for repair

- Most economical way of repairing an instrument
- Minimal downtime
- Guaranteed product return time
- Easy budgeting
- Reduced service cost

5 — PARTS EXCHANGE SERVICE

- Call **800-333-7770** 608-868-4678
- Ask for "Technical Service Support"

- Next-day parts shipment***
- Shipped via air express, UPS, or mail, according to the urgency of your need

- Protects against high cost of replacement parts
- Technical customer support hotline
- Offers best economy for your biomedical support groups

* For locations within 100 miles of a field service engineer.
** Holidays not included.
*** Consumables and ancillary products not included (e.g. cables, accessories, disposables, styli, lamps and batteries).

NOTE: To qualify for next-day service, orders must be received at Siemens Burdick by 1:00 P.M. Central Standard Time.

Guard against the risk of your Siemens Burdick ECG unit being down for a prolonged period. Protect against improper service. Sign up now for UPTIME.

TEAR HERE

Yes, I am interested in the Siemens Burdick UPTIME service program

☐ Please have a service representative contact me and provide costs for the UPTIME contract most applicable to our needs.

☐ Please rush me a completed contract form, showing costs, for our instrument:

NOTE: Model, Serial Number and date purchased must be provided to obtain a completed contract form.

Product name _____

Model No. _____ Serial No. _____

Date purchased _____ Purchased from _____

Name _____ Title _____

Name of facility, practice or institution

_____

Address _____

City _____ State _____ Zip _____

Telephone No. ( ) _____

Siemens Burdick Technical Service Seminars train your Personnel

For facilities with their own Biomedical Service Staffs, Siemens Burdick offers highly informative training classes that qualify your people to become experts at inspecting and effectively maintaining Siemens Burdick instruments. These classes are scheduled at convenient times throughout the year and are conducted at Siemens Burdick headquarters in Milton, Wisconsin.

Since highly personalized teaching methods are used, the size of these classes is limited. Those interested in attending should make arrangements well in advance.

A schedule of classes for the coming year and additional information on these Technical Service Seminars may be obtained by contacting: Technical Service Training, Siemens Burdick, Inc. 15 Plumb Street, Milton, WI 53563; or call (800) 333-7770 or (608) 868-4678.

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15 Plumb Street
Milton, WI 53563-9988

Refer to Fig. 49 for these keys:

REVIEW ECG → Displays the Lead Review Menu (see REVIEWING RECORDS). Use this key when you want to review the patient's ECG.

START (X) PRINT → Press START to display the Manual Print Menu (see PRINTOUTS). Use this key when you want to print the current record.

Press (X) to toggle the status of the current record between printed and *un*printed. This key is helpful in specifying files for batch printing. (Previously printed records are marked with an "X".) Only unmarked records will be batch printed.

START (X) XMIT → Press START to display the start transfer screen (see TRANSFERRING RECORDS). Use this key when you want to transfer the current record.

Press (X) to toggle the status of the current record between transferred and *un*transferred. This key is helpful in specifying files for batch transferring. (Previously transferred records are marked with an "X".) Only unmarked records will be batch transferred.

Housekeeping Functions

Several housekeeping functions help to optimize your use of the Directory. These functions include categorizing, sorting, and deleting records. Also, you can print a list of the Directory's contents.

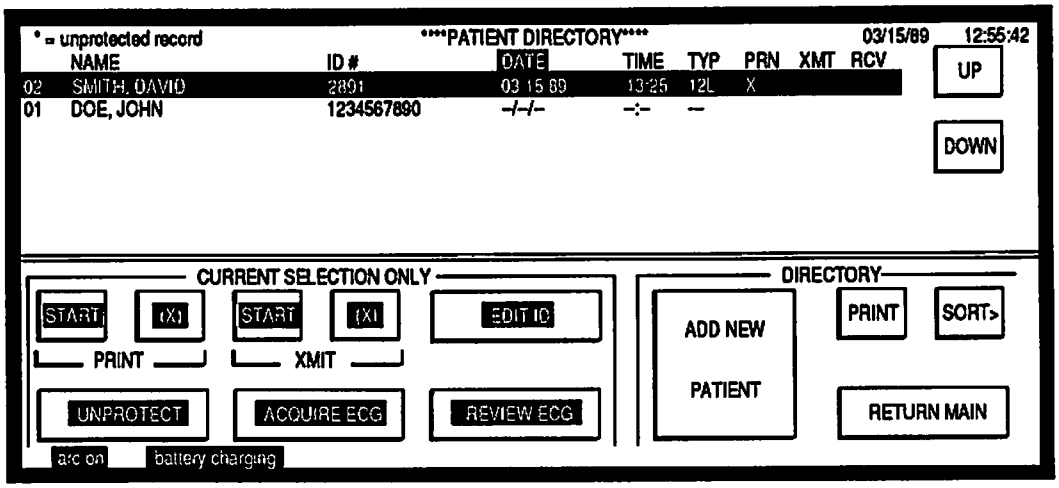
Directory records can be either protected or unprotected. Protected records are *never* overwritten or deleted. Unprotected records are replaced by newly acquired records. However, this only happens when more space is needed. (There is room in memory for about 45 records.) When the Directory becomes full, the oldest unprotected record is overwritten by a new record.

If all records were protected, the Directory would soon become full. Therefore, the E550 can be configured to automatically unprotect records after they have been printed and/or transmitted (see CONFIGURING THE E550). Also, you can manually toggle the current record between protected and unprotected. These manual actions are independent of the configuration setting.

☞ *NOTE: If the Directory becomes full when the E550 is configured for AUTO PROTECT ON, the current record will be lost. To create more space, manually unprotect additional Directory records.*

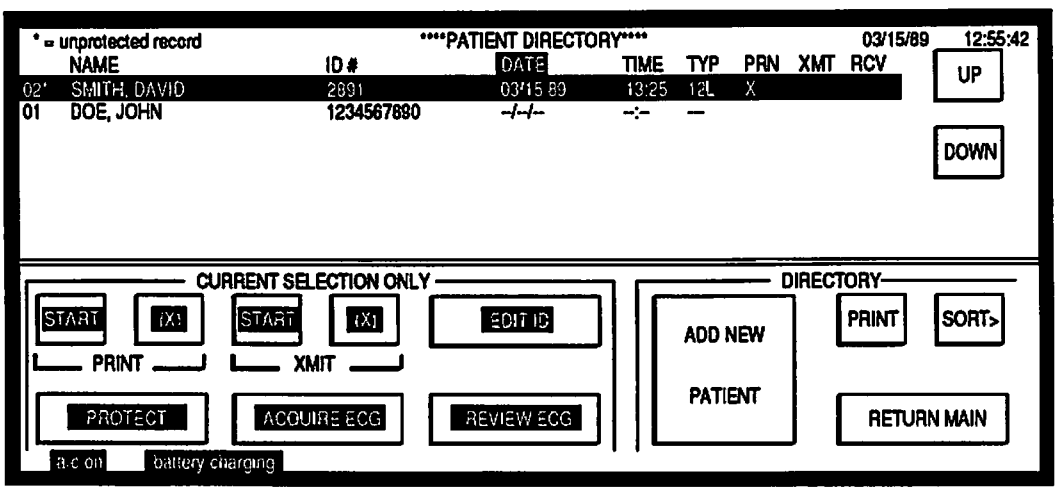
UNPROTECT → Unprotects the current record (Fig. 49). Unprotected entries are marked in the Directory with an asterisk. When pressed, this key changes to PROTECT ECG.

Figure 49
Protected Record



PROTECT → Protects the current record (Fig. 50). When pressed, this key changes to UNPROTECT.

Figure 50
Unprotected Record



DELETE → Deletes the current record (Fig. 48). If you have entered patient demographics, but not acquired an ECG, then the record can be deleted.

☞ *NOTE: If the record is deleted, it is permanently removed from the Directory.*

PRINT → Prints a list of the Directory's contents (Fig. 48). Records are listed according to the current sort order. The PRINT key appears *only* when the AC power switch is ON. See Appendix B for sample printouts.

SORT> → Sorts the Directory entries. (Only appears if there are two or more entries.) You can sort by name, ID #, or date. Each time you press SORT>, the highlight bar moves to the next column and the records are sorted accordingly (Fig. 51-53). The name sort considers all characters in the field, and does not differentiate between first and last names. Numbers at the left of each record indicate the sort order. Note that number 1 may not be on top of the list because the current selection is always first. Also, unprotected records are sorted and placed *after* any protected records. The default sort is by date.

Figure 51
Sorted by Date

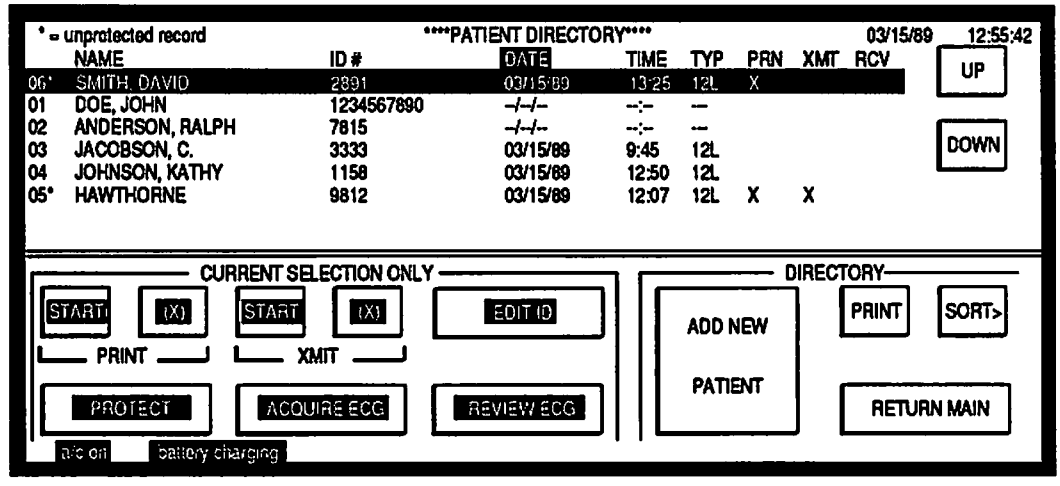
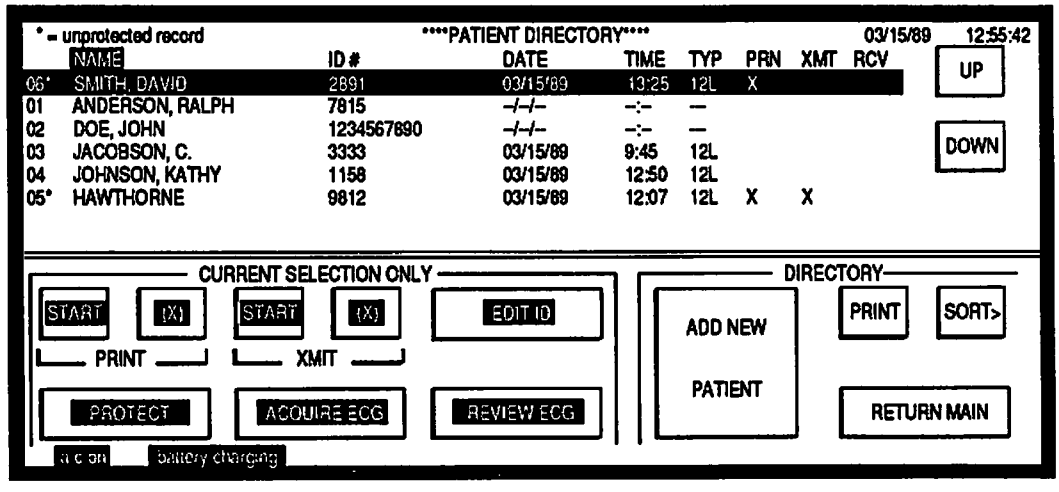


Figure 52
Sorted by Name



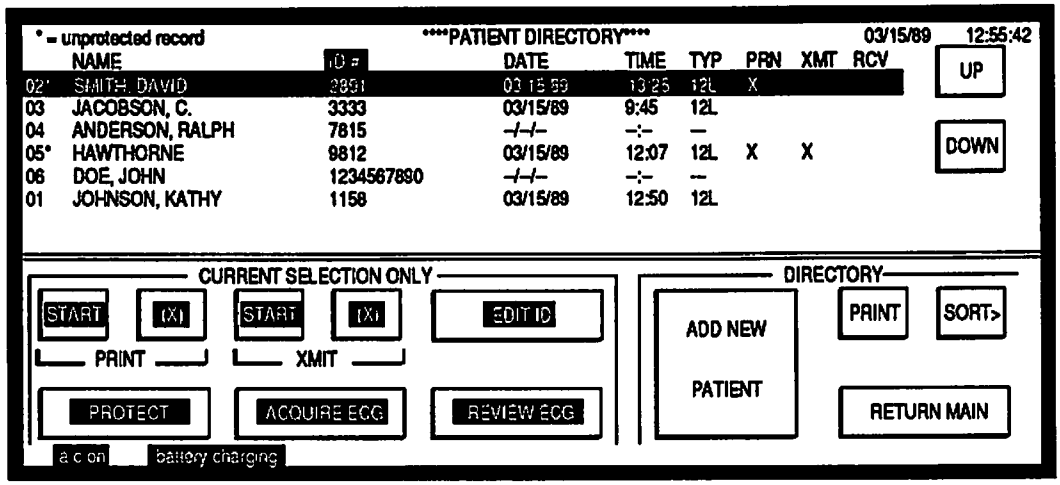


Figure 53
Sorted by ID Number

PRINTOUTS

The E550 can produce a variety of printouts. If you are in auto mode, printouts occur automatically according to the configuration settings (see CONFIGURING THE E550). If you are in semi-auto or manual mode, the E550 allows you to select options from the Manual Print Menu (Fig. 54).

☞ *NOTE: Printing is available only when the AC power switch is ON.*

Manual Print Menu

The Manual Print Menu (Fig. 54) appears immediately after you have acquired an ECG in semi-auto or manual mode (see ACQUIRING RECORDS), or when you print a record from the Directory (see USING THE DIRECTORY).

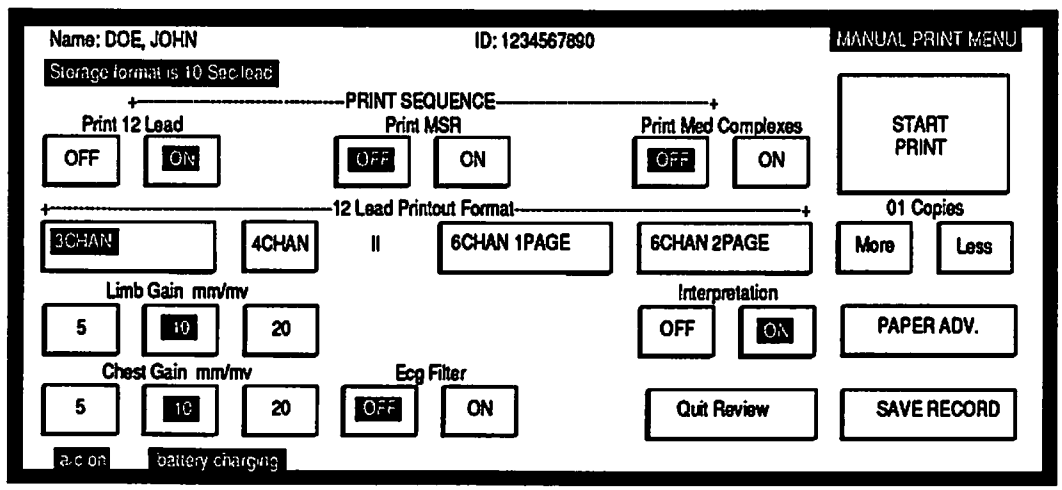


Figure 54
Manual Print Menu

These options are available from the Manual Print Menu:

OFF | ON → Turns printing ON or OFF for the 12 Lead ECG waveform, measurement matrix (MSR), median complexes, and/ or interpretation statements. Also, turns ECG noise filter ON or OFF.

3CHAN → Selects the 12-Lead Printout Format. You can choose 3CHAN, 4CHAN, 6CHAN 1PAGE, or 6CHAN 2PAGE. For the 4-channel printout, you can select which lead appears in the fourth channel. See Appendix B for sample printouts.

5 | 10 | 20 → Sets the Limb and Chest Gains to 5, 10, or 20mm/mv.

More | Less → Press MORE or LESS to determine the number of copies to print.

PAPER ADV. → Advances the paper for one full sheet.

START PRINT → Begins printing the record. You will see the "Waiting for printout(s) to complete" screen. Upon completion, or if you press STOP PRINT, the Manual Print Menu returns.

SAVE RECORD → Saves the acquired ECG in the Directory. You will see the "Waiting for completion of save" screen. Upon completion, the E550 returns to the Directory with the new record highlighted at the top of the list. If patient demographics have not been entered, the patient identification menu appears. SAVE RECORD is displayed only if the record has not been saved.

Quit Review → Returns to the Preview - Acquire Menu or Directory, depending upon the point of origin. If the record has not been saved, the E550 gives you a second chance to do so before exiting.

Rhythm Strips

You can print rhythm strips by pressing PRINT RHYTHM from the Main Menu (Fig. 7) or the Preview-Acquire Menu (see ACQUIRING RECORDS).

PRINT RHYTHM → If you press this key from the Preview-Acquire Menu, the E550 displays a menu to select the lead group, chest and limb gains, writer speed, and filter on/off settings for the rhythm strip (Fig. 55). The optional lead group is third from the right under Lead Group to Print (see CONFIGURING THE E550).

Press START PRINT to begin printing the rhythm strip. You may change the printout characteristics at any time during printing. If you need to queue the paper, press PAPER ADVANCE. Use the STOP PRINT key to end printing (Fig. 56).

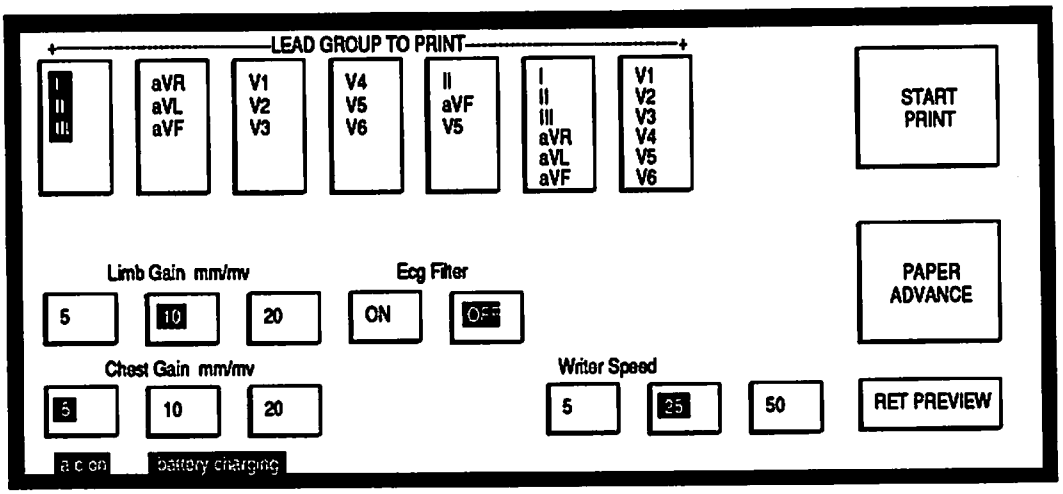


Figure 55
Print Rhythm Start

A short-cut method for printing rhythm strips is to press PRINT RHYTHM from the Main Menu. The E550 immediately begins printing a rhythm strip using leads I, II, and III. The patient's name and identification number are blank on the printout. Press STOP PRINT to quit (Fig. 56). Press RET PREVIEW to go to the Preview-Acquire Menu.

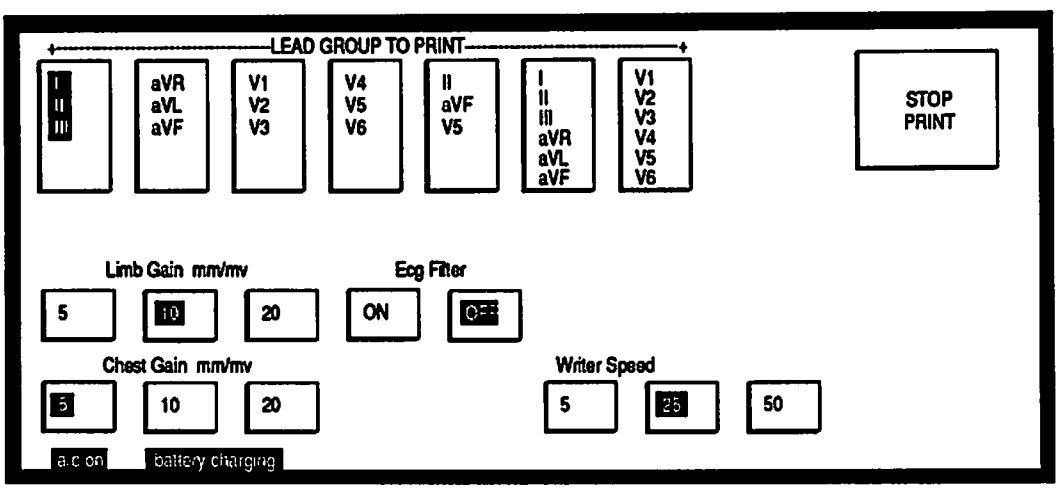


Figure 56
Print Rhythm Stop

Electrocardiograms

The E550 prints electrocardiograms with interpretive data in several formats. These include rhythm, 3-channel, 4-channel, and 6-channel printouts. Also, median complexes and measurements can be printed. Refer to Appendix B for sample printouts.

The electrocardiogram has a calibration pulse at the start of each waveform. The first half of this pulse indicates limb lead sensitivity, while the second half shows chest lead sensitivity. Each lead is identified above its respective waveform. Patient demographic information is printed at the top of the page, followed by the interpretive analysis (if en-

abled). Limb and chest lead gains are printed at the bottom, along with the paper speed and filter settings. Also, the storage format is printed at the bottom.

A small letter at the lower left corner of the page indicates the printout's status. The code is as follows: "r" = reviewed, "n" = not saved (or printed before saved), and "rc" = reviewed / received. If in stress mode, two additional codes can appear: "p" = pre-stress (before communication with the monitor) and "s" = stress (after communication with the monitor).

Batch Printing

With a single key press, you can tell the E550 to print all previously unprinted Directory records. From the Main Menu, press BATCH PRINT (Fig. 57):

BATCH PRINT → Automatically prints all previously unprinted ECGs. The screens shown in Figs. 58 and 59 appear for each record. When finished, the E550 returns to the Directory.

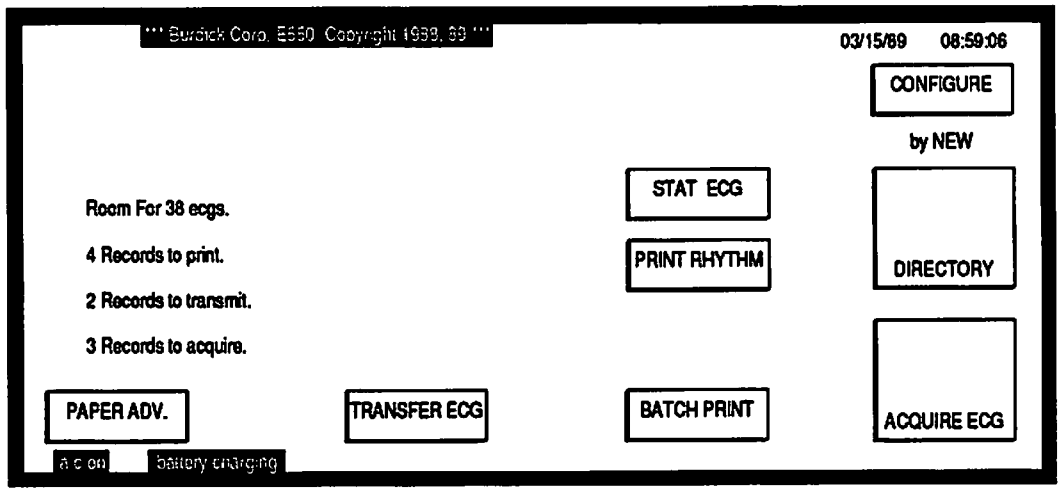


Figure 57
Main Menu

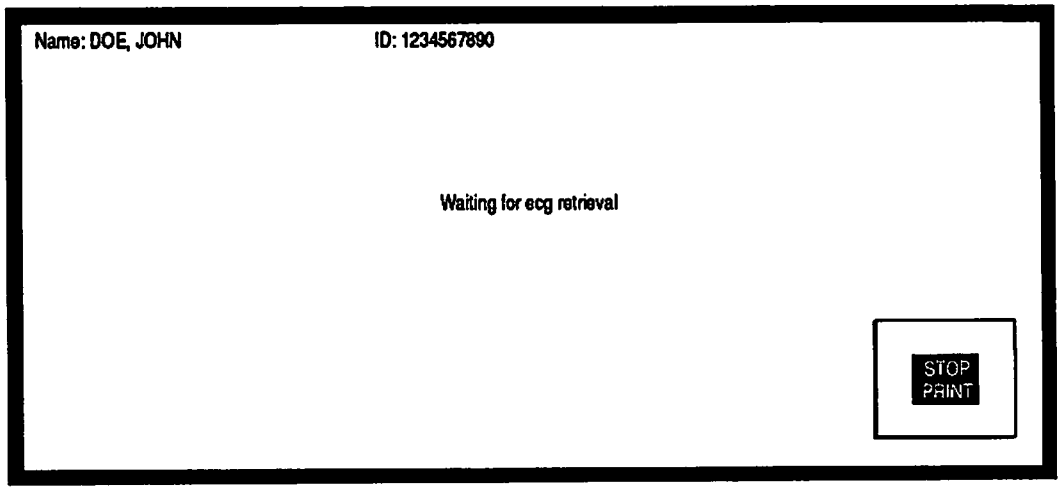
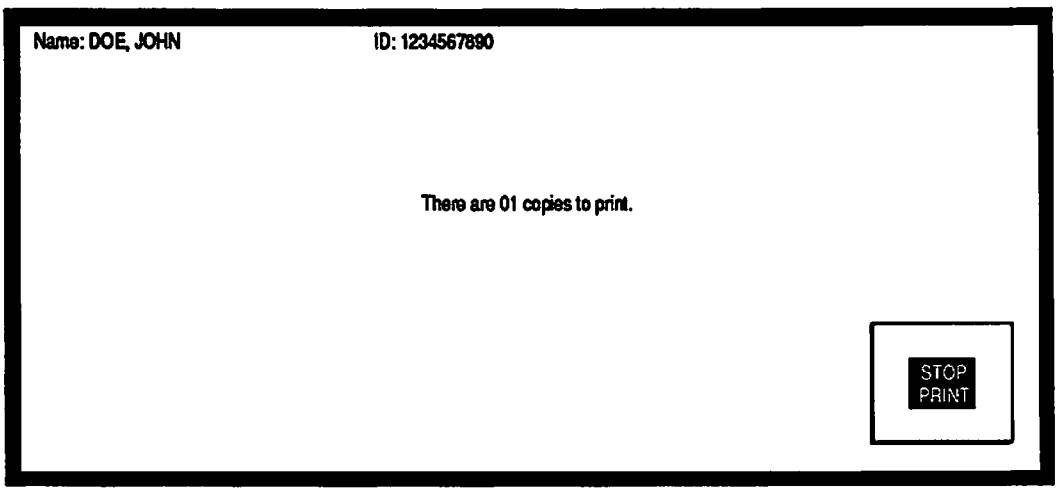


Figure 58
Waiting for ECG Retrieval

Figure 59
Copies to Print



Directory Listing

You can print a list all records in memory by pressing PRINT from the Directory (Fig. 48).

PRINT → Prints a list of the Directory's contents. Records are listed according to the current sort order. The PRINT key appears *only* when the AC power switch is ON. See Appendix B for a sample printout.

TRANSFERRING RECORDS

The E550 can transfer records by means of the telephone line or a direct connection to compatible Burdick equipment. There are several transfer modes. These include sending and receiving records individually or batched, as well as special transfers from Burdick's E-Scribe ECG Management System. In most cases, the E550 returns to the Directory upon completion of the transfer.

Patient Record(s) Transfer Mode Menu

The Patient Record(s) Transfer Mode Menu (Fig. 60) is displayed when you press TRANSFER ECG from the Main Menu (Fig. 57). The following choices are available:

AUTO SEND ECGS then RECEIVE ECGS → Transmits all previously untransmitted records. After the records are sent, the E550 automatically receives any available records. This eliminates the need for re-dialing to establish another connection.

SEND ECGS → Transmits all previously untransmitted records. (To send the current Directory record, see USING THE DIRECTORY.)

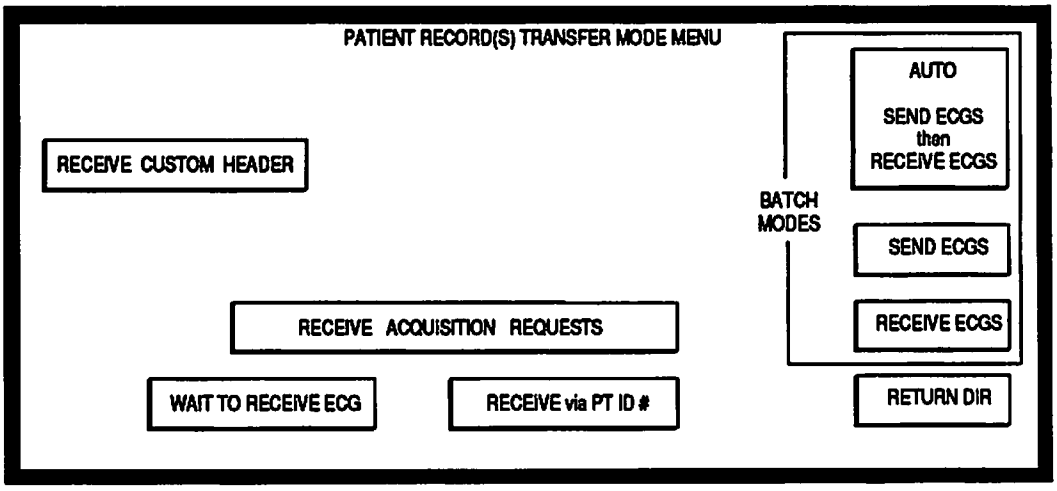


Figure 60 *Patient Record(s) Transfer Mode Menu*

RECEIVE ECGS → Enables a batch reception of all available ECG records from the E-Scribe.

RETURN DIR → Returns to the Directory.

WAIT TO RECEIVE ECG → Automatically receives records when they are made available by another compatible electrocardiograph.

☞ *NOTE: The AC power must be ON for this feature to be functional.*

RECEIVE via PT ID # → Asks you for a specific patient identification number. Then, the corresponding record is received from the E-Scribe.

RECEIVE CUSTOM HEADER → See Custom Headers.

RECEIVE ACQUISITION REQUESTS → See Acquisition Requests.

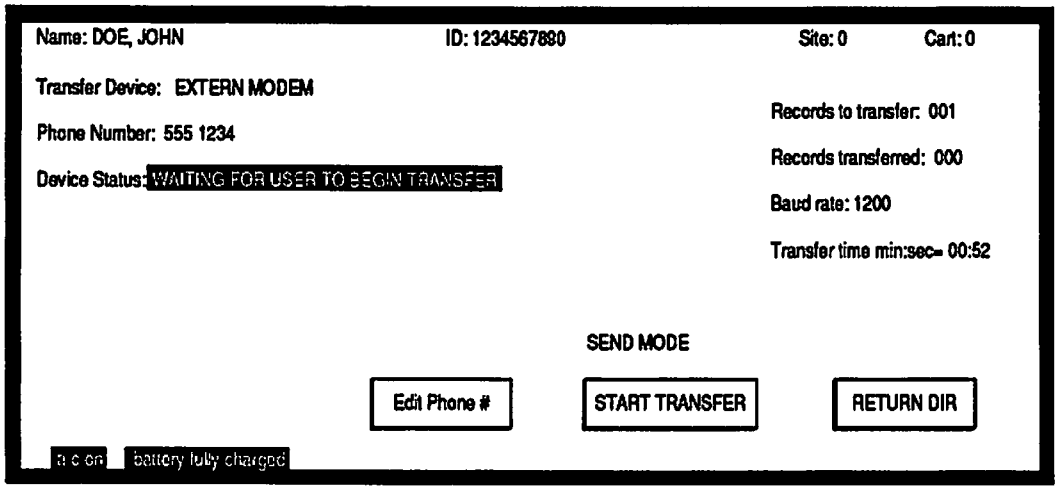
Sending and Receiving

After you have selected a transfer mode, the screen will change to show the current status (Fig. 61). Patient information is displayed across the top. The transfer device, phone number, and baud rate are determined by the configuration. If a phone number was not entered during configuration, the E550 beeps and warns you of the situation.

The device status displays various messages such as, "waiting for user to begin transfer", "dialing...", and "connect". Also, the number of records to be transferred, number of records already transferred, and time required to complete the transfer are specified. The current transfer mode ("send mode", "receive mode", "auto answer mode", "receive

requisitions", or "receive custom header") is shown just above the START TRANSFER key.

Figure 61
Start Transfer



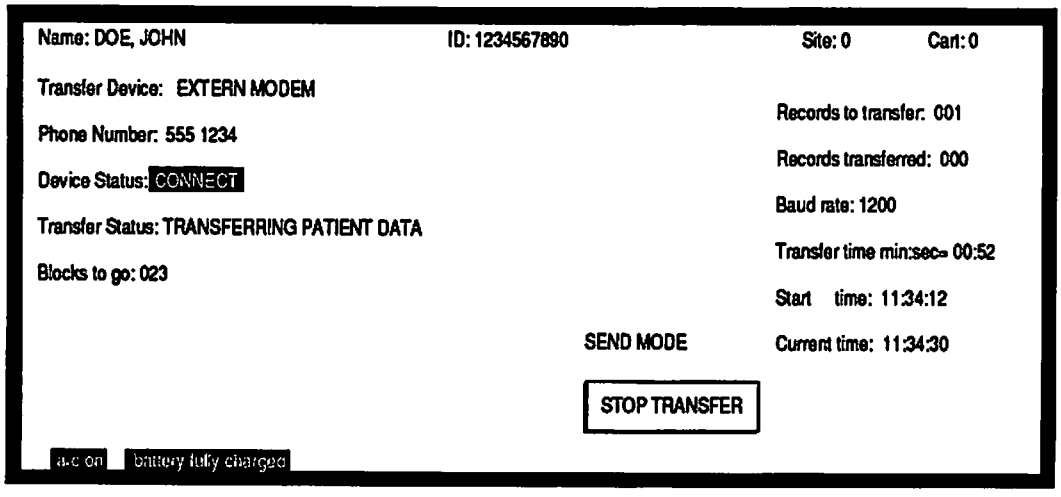
START TRANSFER → Press to begin the transfer. When the transfer is in progress, several more status items appear on the screen (Fig. 62). The current and start times for the transfer are displayed; and blocks to go counts down to zero. If STOP TRANSFER is pressed, the transfer is aborted.

STOP TRANSFER → Aborts the transfer (Fig. 62).

Edit Phone # → Allows you to edit the phone number before initiating a transfer (Fig. 63). Use this key to enter a phone number if none was entered in the configuration. The new phone number remains in effect only for the current session.

RETURN DIR → Returns to the Directory.

Figure 62
Stop Transfer



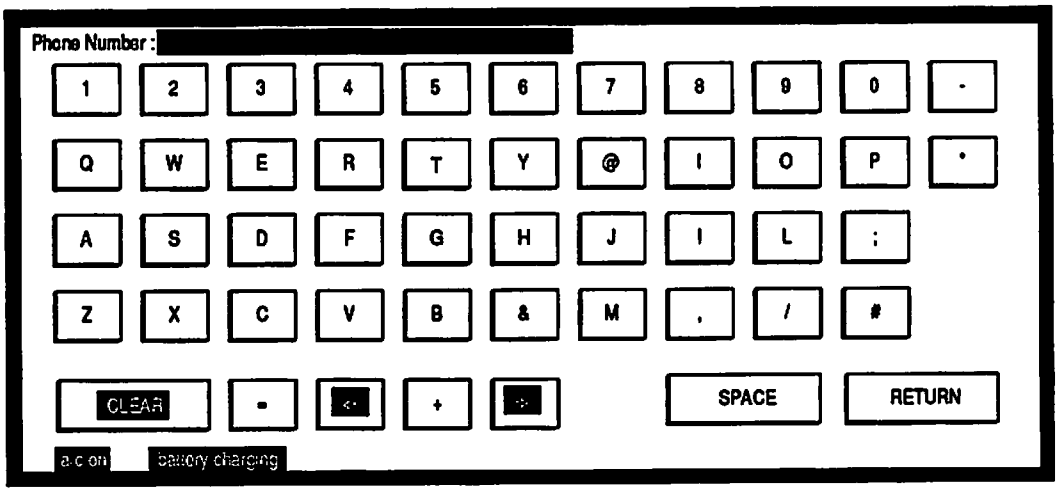


Figure 63
Edit Phone Number

Custom Headers

The E550 can receive customized demographic headings from the E-Scribe. Once a custom header is downloaded, the format is applied to all new records.

☞ *WARNING — If you download custom headers and then wish to return to the standard headings, a special procedure must be performed by your Burdick Service Representative to restore the defaults.*

To download a custom header, press RECEIVE CUSTOM HEADER from the Patient Record(s) Transfer Mode Menu (Fig. 60). Press START TRANSFER to begin the transfer.

Acquisition Requests

The E550 also can download records (from the E-Scribe) which have demographic information, but no ECG. These records are saved in the Directory so that you can acquire the ECGs at a later date.

Press RECEIVE ACQUISITION REQUESTS from the Patient Record(s) Transfer Mode Menu (Fig. 60) to begin the process. Next, the E550 asks you to enter the request ID code (Fig. 64). This code is determined by the E-Scribe (refer to the Operator's Manual). For convenience, it remains in memory until you change it.

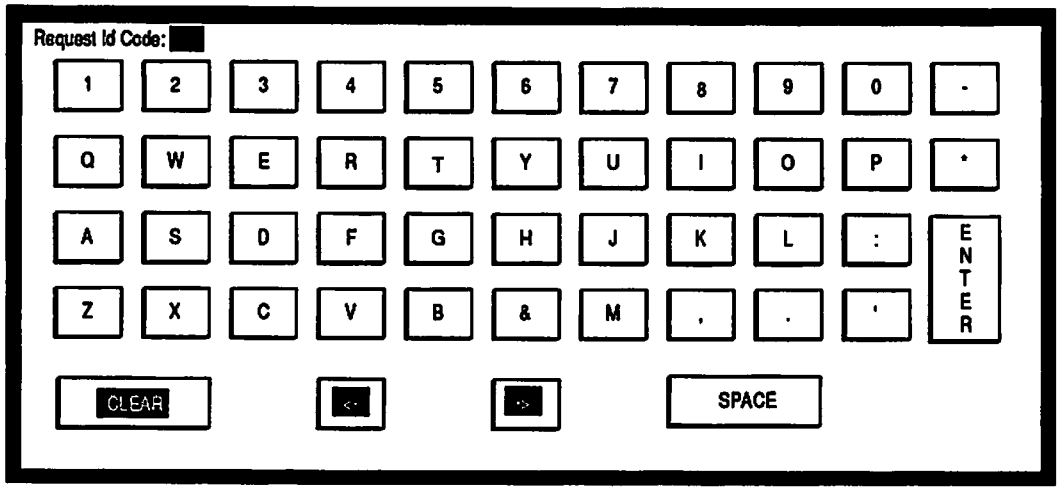


Figure 64
Request ID Code

Two additional keys appear for requisitions. You can select either NEW or OVERRIDE as described below. The current selection is highlighted.

Refer to Fig. 65 for the following keys:

NEW → Retrieves only those demographic records from the E-Scribe which have not been sent previously.

OVERRIDE → Retrieves all available demographic records from the E-Scribe, regardless of whether or not they have been sent previously.

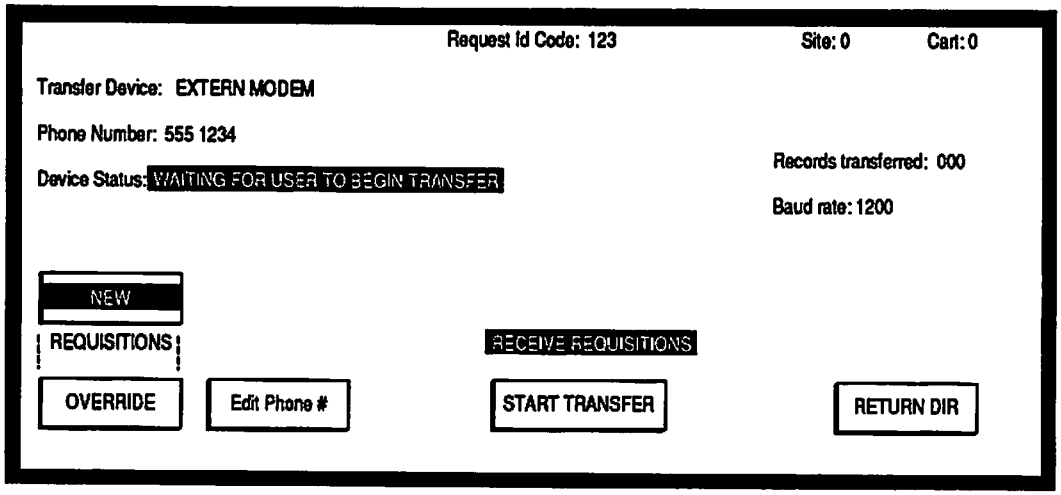


Figure 65
Acquisition Requests

5 *Problem Solving*

ARTIFACTS

Improper ECG technique often results in artifacts and other defects which can interfere with the interpretation. Most often, artifacts are caused by patient movement, muscle tremor, improperly applied sensors, or electrical interference.

Somatic Tremor

Patient movement can cause abnormal trace deflections. Muscle contraction or tremor can result in an irregular vibration in frequency and amplitude. Body or sensor movement can cause major shifts in the baseline. Fig. 66 is typical of this kind of artifact.

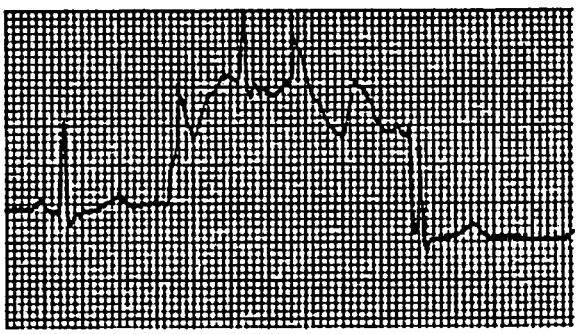


Figure 66
Somatic Tremor and Patient Movement

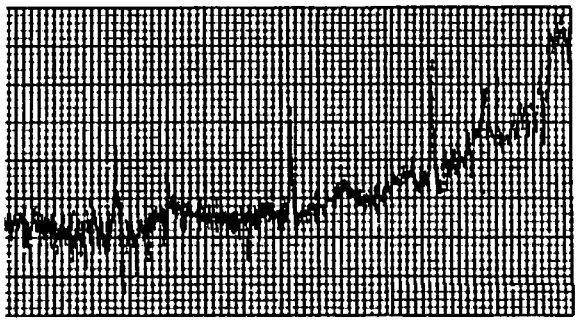
Artifacts of this type can be minimized by gaining the patient's full cooperation. A simple explanation to the patient of why it is necessary for him/her to relax; or the use of a larger, more comfortable bed can be helpful. In some cases, somatic tremor is unavoidable. But often, it can be minimized by having the patient place his/her hands under the buttocks.

Improperly Installed Sensors

An example of baseline shift caused by loose sensors is shown in Fig. 67. If the baseline does not center within half a minute of first attempting to record that particular lead,

check the sensor to ensure that it is properly applied. An unavoidable baseline jump occurs when leads are switched during an R or T wave. If baseline drift occurs (shifting up or down), it is likely due to patient respiration or corroded sensors.

Figure 67
Loose Sensors



Corroded Reusable Sensors

Corroded sensors can cause a variety of artifacts such as large sawtooth waves, drifting, and blocking. Avoid this problem by always ensuring that sensors are properly cleaned after each use. Electrolytes and pastes other than the recommended types can introduce problems due to poor conductivity or film build-up on the sensor. If a paste or cream is used, wash the sensors after each use, and scour them frequently with a non-abrasive cleaner.

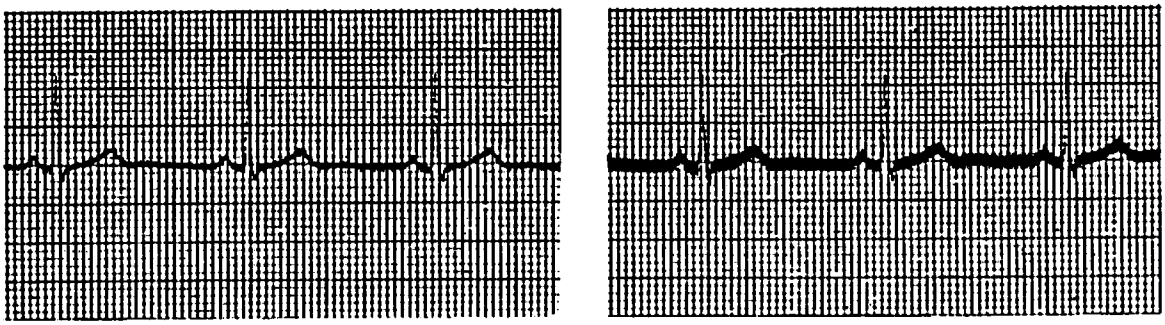
Loose or Broken Leads

A loose or broken lead wire may cause rapid and erratic trace deflections. Similarly, large amplitude excursions can be caused by a poor connection at the sensors. The E550 indicates this by displaying the words "noisy", "fail", or "drift" on the display.

Electrical Interference

Electrical interference caused by alternating current (AC) can obliterate much of an ECG recording by producing an abnormally wide baseline. Its amplitude depends on the strength of the AC source and the lead being recorded. In any one lead, the amplitude of the interfering signal is uniform. The frequency corresponds to the power supply frequency (usually 60Hz). Typical AC interference on the ECG is illustrated in Fig. 68.

Figure 68
AC Interference



To eliminate or minimize AC interference:

1. Locate the E550 so that the power cord is away from the patient and the patient cable. Do not pass the power cord under or near the patient or table.
2. Ensure that the E550 is connected to a properly grounded wall outlet. It is advisable to ground metal bed frames by connecting them to the electrocardiograph via the auxiliary ground wire.
3. The patient cable leads should be arranged as close together as possible and following the body contour. Avoid looping excess lead wires. Rather, twist them together to take up any excess length.
4. Diathermy or X-ray equipment in adjacent offices should NOT be in operation when recording an ECG. Other electrical equipment, including electrically actuated beds or lighting fixtures, may also generate interference even when not in use. If this proves to be a problem, disconnect such equipment.
5. Electrical wiring in walls and ceilings is also a possible source of AC interference. Frequently, simply moving the patient table to a different location in the room alleviates the problem. Occasionally, in severe cases, it may be necessary to place a grounded screen between the AC source and the patient.
6. Check the E550's configuration parameters. Turning the filter ON may effectively limit AC interference. In extreme cases where the problem cannot readily be solved by the user, contact your Burdick Service Representative. He can aid in pin-pointing the source of interference and can offer additional guidance.

PAPER JAMS

The E550 has a hidden menu to aid in clearing paper jams. From the Main Menu, press on the lower right side of the display (in the grey area) just below the ACQUIRE ECG key to

bring up the menu shown in Fig. 69. This menu lets you jog the paper forward or backward to clear the jam.

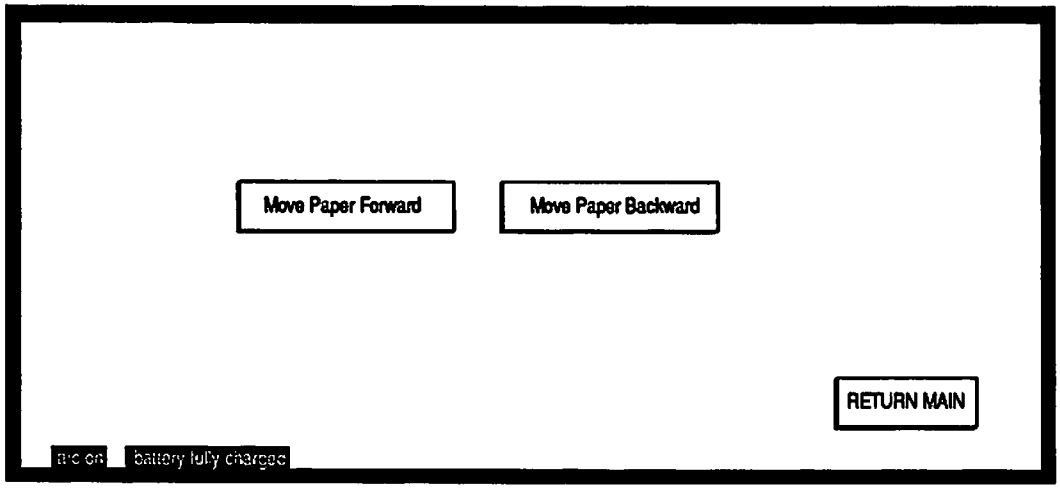


Figure 69
Clearing a Paper Jam

ERROR MESSAGES

Error messages are intended to help you track down problems. If error messages other than the ones described here occur frequently, contact your Burdick Service Representative.

Out of Paper

This is displayed when the E550 runs out of paper. When this occurs, reload the paper and press PAPER ADVANCE.

Paper Possibly Jammed

If the paper is loaded and the queueing sensor does not detect a paper hole, this message is displayed. Clear the jam and press PAPER ADVANCE.

Patient Directory is Full; Delete and/or Unprotect 1 or More Records

This occurs when the Directory has no room for additional records. To create more space, records must be deleted or unprotected.

☞ *NOTE: When this message appears, the currently acquired ECG record will be lost.*

Battery Needs Charging

The battery needs charging. Refer to Section 2.

Battery has Insufficient Charge to Continue

The battery charge is too low to continue operation. Refer to Section 2.

Possible Printhead Failure

If this message is displayed, contact a Burdick Service Representative.

Possible Power Supply Failure

This message can occur if the AC power source is interrupted during printing. Check the electrical outlet and power cord. If the message persists, contact a Burdick Service Representative.

MAINTENANCE

The E550 Electrocardiograph is designed to require very little preventive maintenance. It should be cleaned frequently with a soft, damp cloth. Do not use cleaners or abrasives which could cause damage. A mild detergent solution may be used. Fuse replacement should be referred to a qualified service technician.

Appendix A - Specifications

Dimensions:	4.5" x 15.25" x 18"
Weight:	19 lbs.
Power Requirements:	115/230VAC, 50/60Hz standard 12Vdc lead-acid battery
Environmental:	
operating temperature	15°C to 35°C
relative humidity	30% to 70%, non-condensing
Acquisition:	
lead selection	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
interpretation	diagnosis, measurements, reasons statements
modes	auto, semi-auto, manual
frequency response	meets or exceeds AAMI standard
input impedance	meets or exceeds AAMI standard
electrode offset tolerance	±300mV
a/d conversion	5µV LSB
Printout:	
paper type	thermal
chart speeds	5, 25, 50mm/s
printout formats	3, 4, or 6 channels, additional rhythm formats
printout device	216mm thermal dot array
paper dimension	8.5" x 11" Z-fold
Communications:	
inputs/outputs	to/from Burdick E-Scribe or modem
transmission speeds	external 300, 1200, 2400, 4800, 9600 baud direct 9600, 19200 baud
Safety:	
leakage current	patient <10µA, chassis <100µA
defibrillator protection	to 5000V, 400J

Appendix B - Sample Printouts

The E550 produces a wide variety of printouts. The appearance of these printouts is determined by the configuration and any manual settings (see CONFIGURING THE E550 and PRINTOUTS in Section 4).

A list of sample printouts follows. This list does not represent all possible combinations. Also, note that the samples have been reduced to fit on the pages.

Directory Listing ..... page 60
Stat ECG ..... page 61
Stat Rhythm ..... page 62
3-Channel ..... page 63
4-Channel ..... page 64
6-Channel, 1 Page ..... page 65
6-Channel, 2 Page ..... pages 66-67
Rhythm ..... page 68
Measurements ..... page 69
Median Complexes ..... page 70

Directory Listing

Burdick Corp. E550c Copyright 1988,89 Rev. 3.09 11/28/89 SITE: 0 CART: 0 DATE: 12/04/89 TIME: 10:36

* = unprotected record

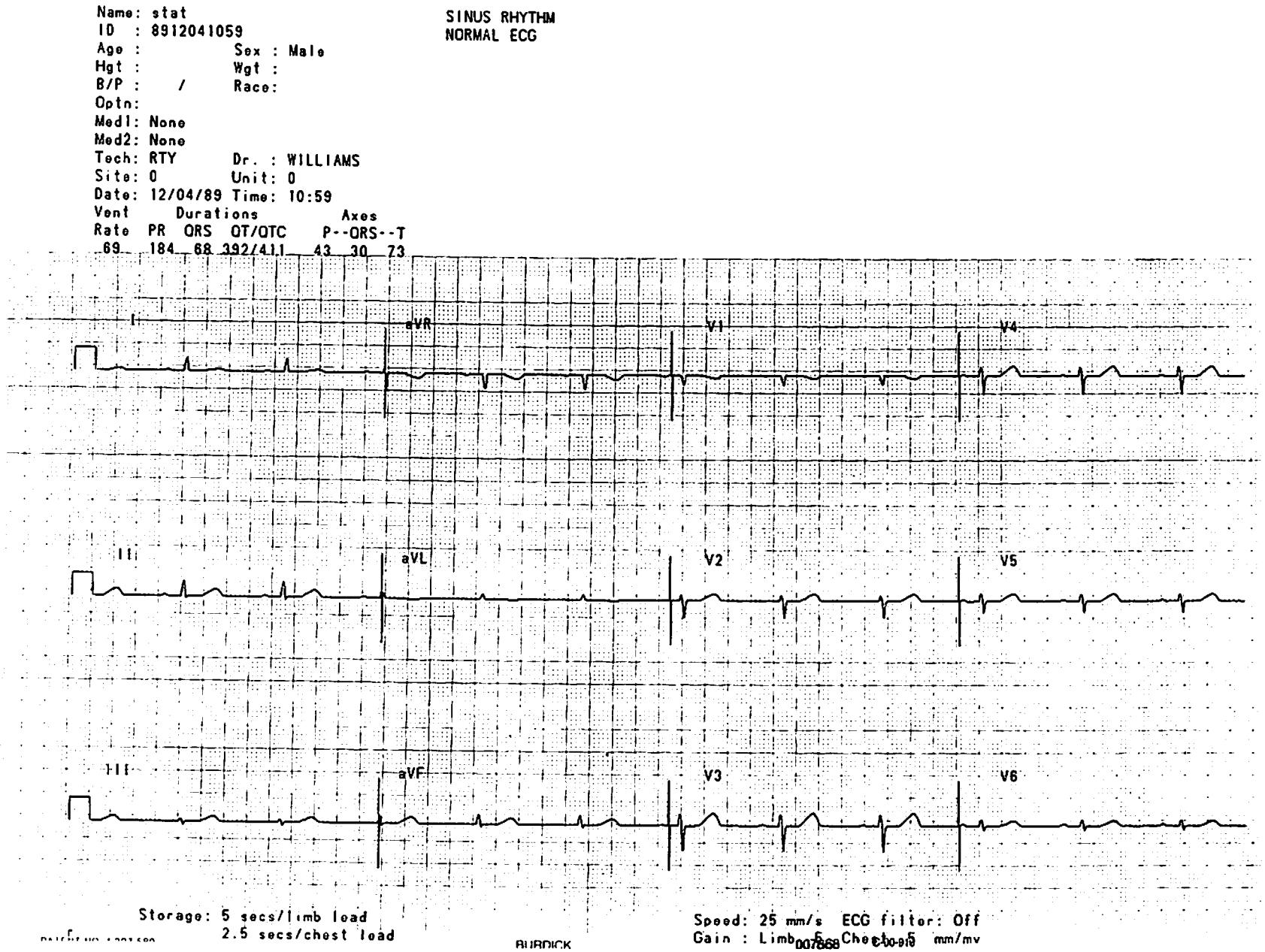
****PATIENT DIRECTORY****

#	*	PATIENT NAME	PATIENT ID #	AGE	SEX	DATE	TIME	TYP	PRN	XMT	RCV
01		GOLZ, RANDY	1128	40	Male	12/04/89	09:36	12L		X	
02		POPE, STEVE	1257	32	Male	12/04/89	09:39	12L	X		
03		PELECH, WALLY	1265	45	Male	12/04/89	09:45	12L		X	
04		KLINGE, RON	1657	35	Male	12/04/89	09:48	12L	X		
05		KOSMOPOULOS, GEORGE	1744	27	Male	12/04/89	09:52	12L		X	
06		GATEWOOD, JOHN	1807	41	Male	12/04/89	09:55	12L		X	
07		EARLEYWINE, MIKE	1696	33	Male	12/04/89	09:59	12L		X	
08		GOODMAN, JIM	4577	29	Male	12/04/89	10:02	12L		X	
09		HERRING, SUE	2041	30	Female	12/04/89	10:05	12L		X	
10		UECKER, KEN	2850	49	Male	12/04/89	10:07	12L		X	
11		WURTH, RANDY	2147	35	Male	12/04/89	10:10	12L		X	
12		BURANDT, JEFF	2771	29	Male	12/04/89	10:12	12L			
13		MCCLURG, DON	4117	31	Male	12/04/89	10:18	12L		X	
14		DOE, JOHN	1234	88	Male	12/04/89	10:21	12L		X	
15		DOE, JANE	1235	86	Female	12/04/89	10:23	12L		X	

BURDICK 007868 C-00-910

PATENT NO 4,207,560

Stat ECG


Name: stat
ID : 8912041059
Age : Sex : Male
Hgt : Wgt :
B/P : / Race:
Optn:
Med1: None
Med2: None
Tech: RTY Dr. : WILLIAMS
Site: 0 Unit: 0
Date: 12/04/89 Time: 10:59
Vent Durations Axes
Rate PR QRS QT/QTC P--QRS--T
69 184 68 392/411 43 30 73
SINUS RHYTHM
NORMAL ECG
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
Storage: 5 secs/limb lead
2.5 secs/chest lead
Speed: 25 mm/s ECG filter: Off
Gain : Limb & Chest 5 mm/mv
BURDICK
007868

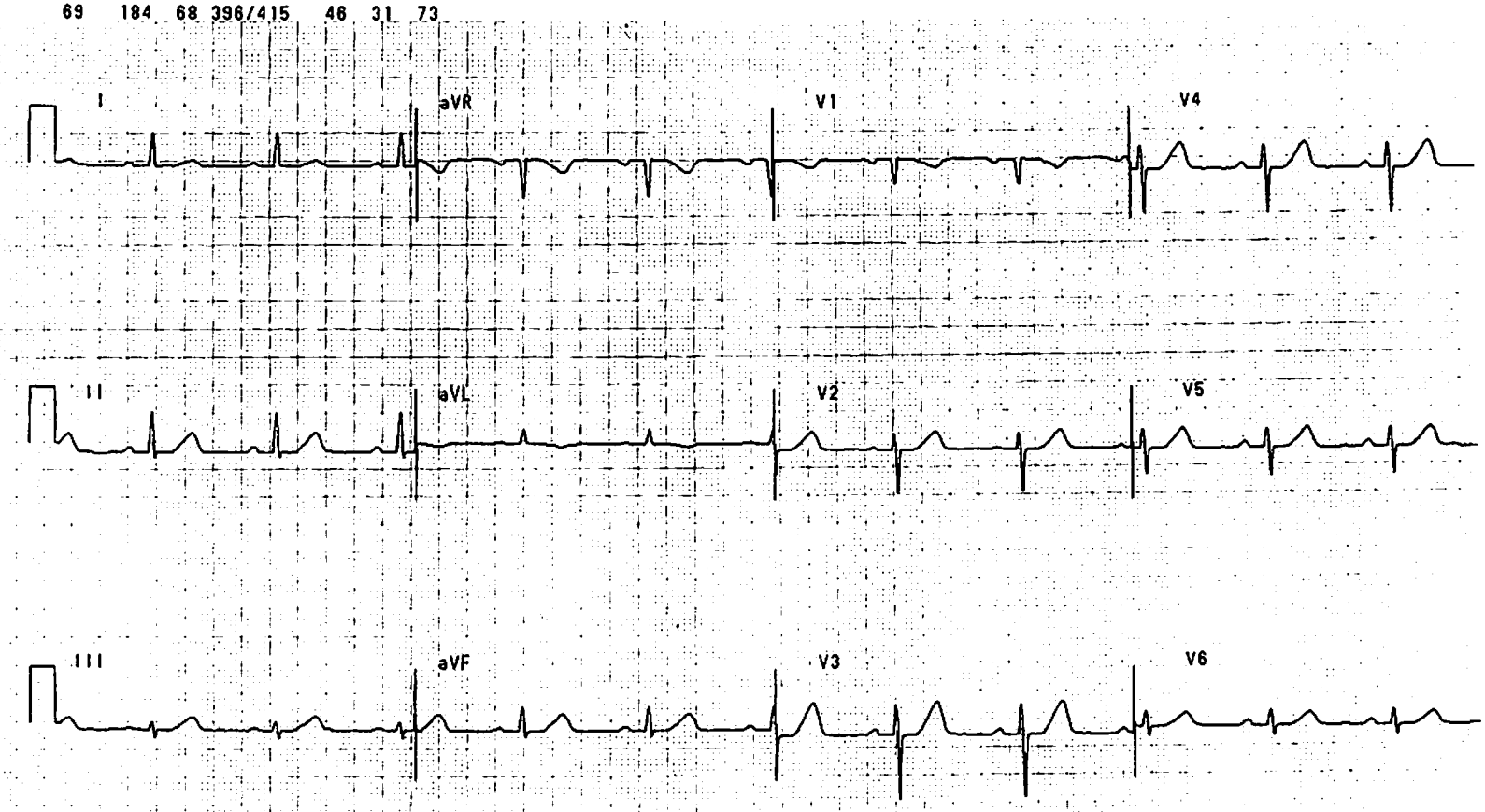
Stat Rhythm

Name:
ID :
13:09 12/04/89
Speed: 25 mm/s ECG filter: Off
Gain : Limb 10 Chest 5 mm/mv

Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36

SINUS RHYTHM
NORMAL ECG

Vent	Durations			Axes		
Rate	PR	QRS	QT/QTC	P	QRS	T
69	184	68	396/415	46	31	73



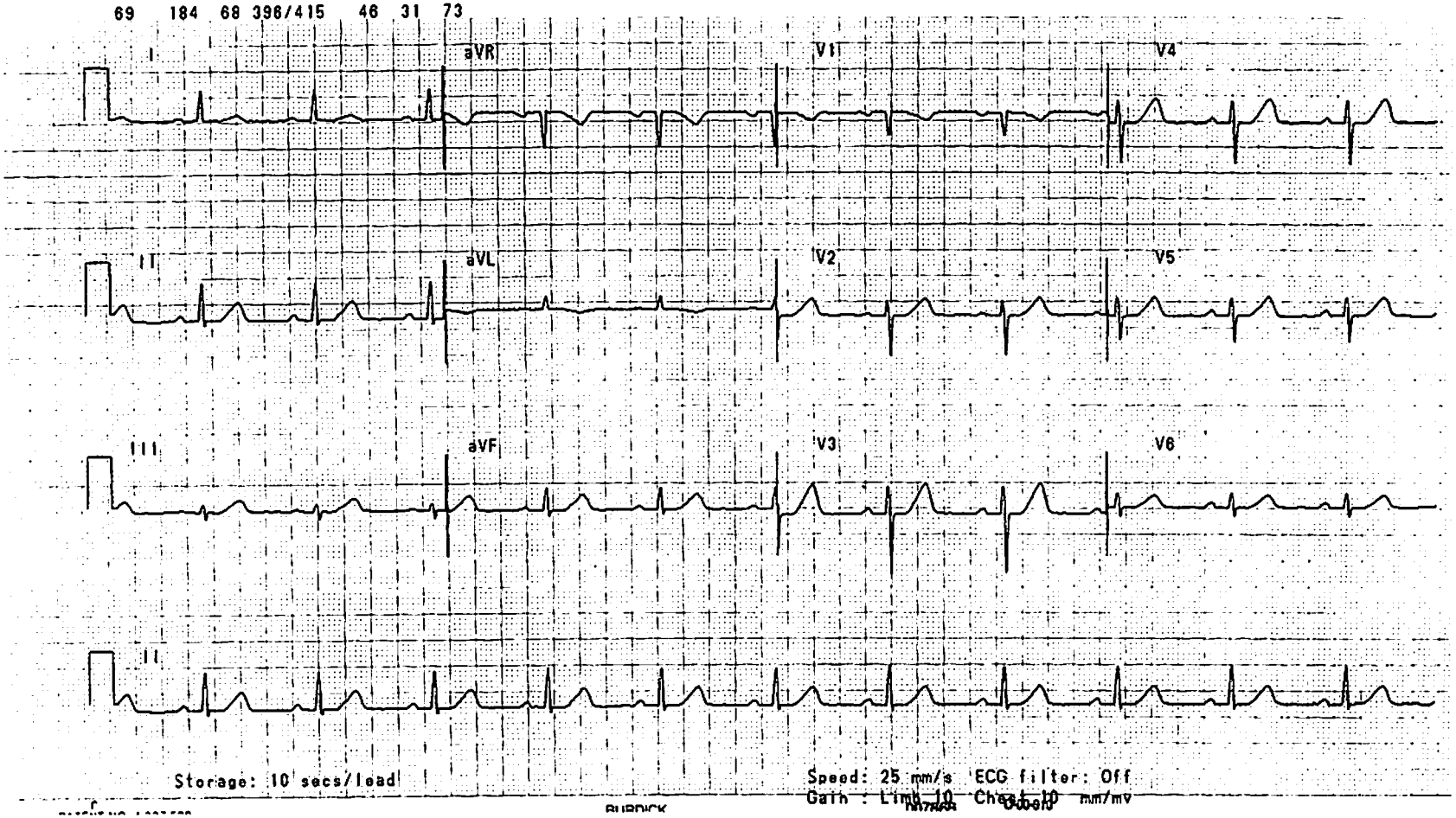
BURDICK

4-Channel

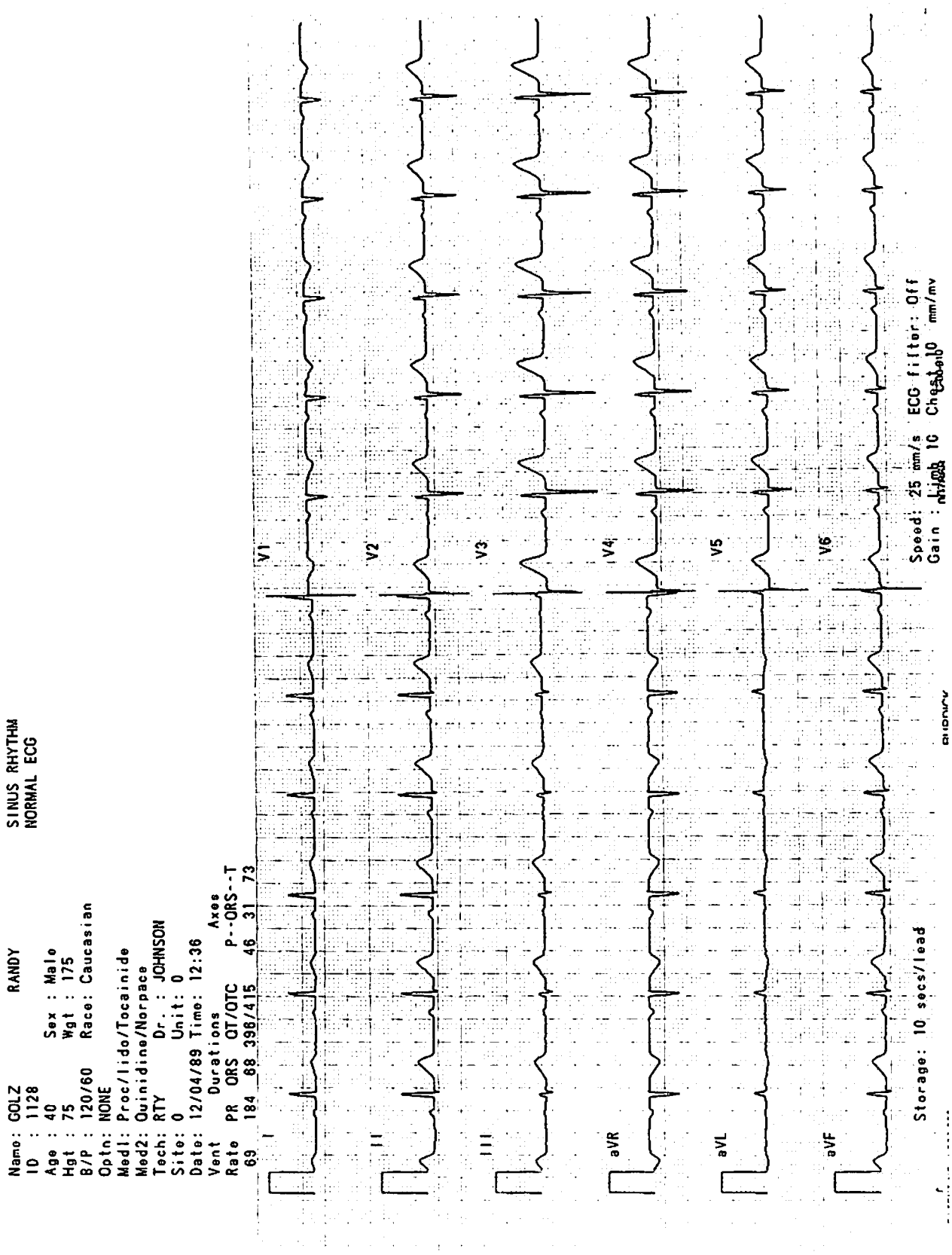
Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36

SINUS RHYTHM
NORMAL ECG

Vent	Durations			Axes		
Rate	PR	QRS	QT/QTC	P	QRS	T
69	184	68	396/415	46	31	73



6-Channel, 1 Page



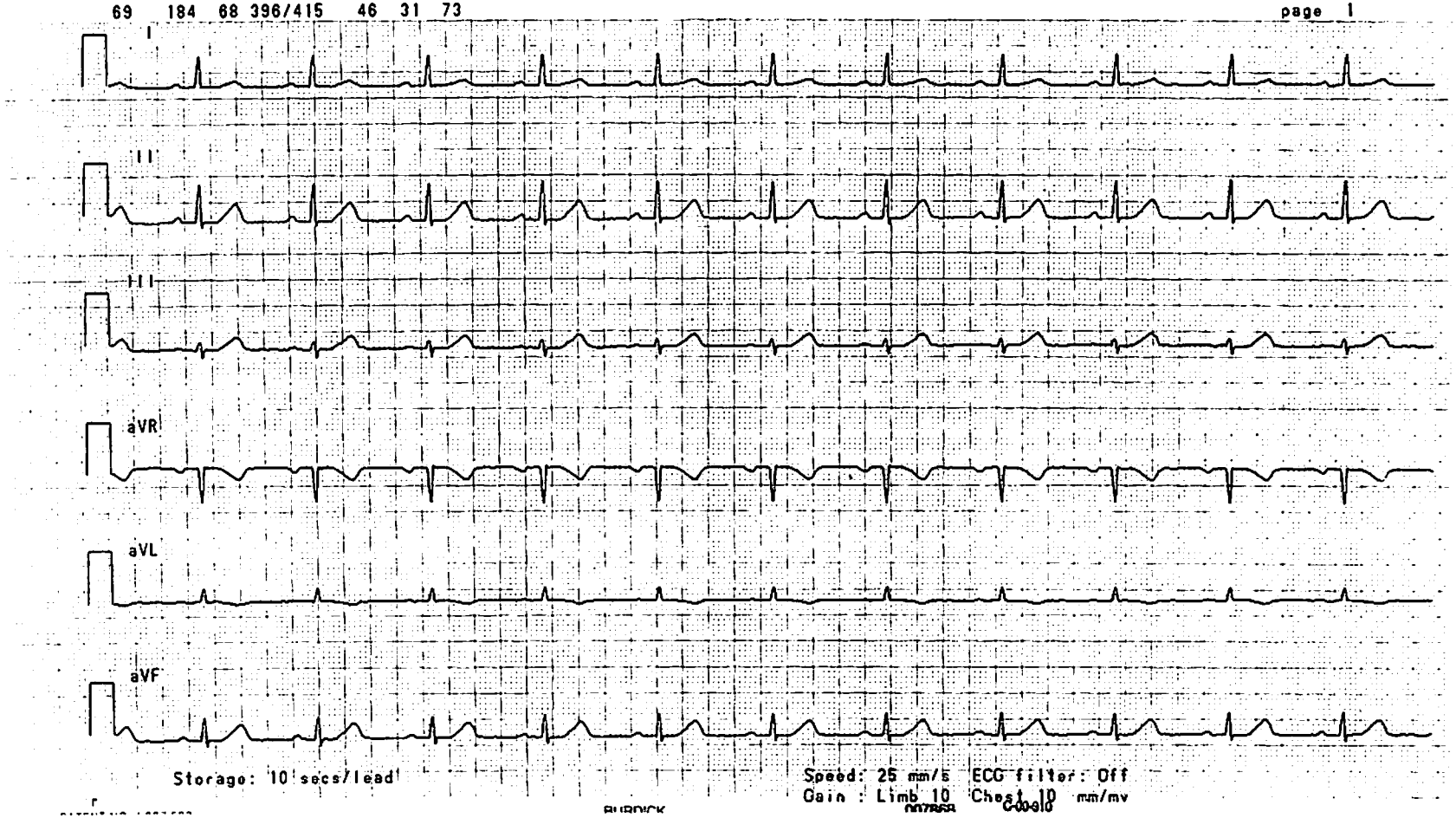
6-Channel, 2 Page

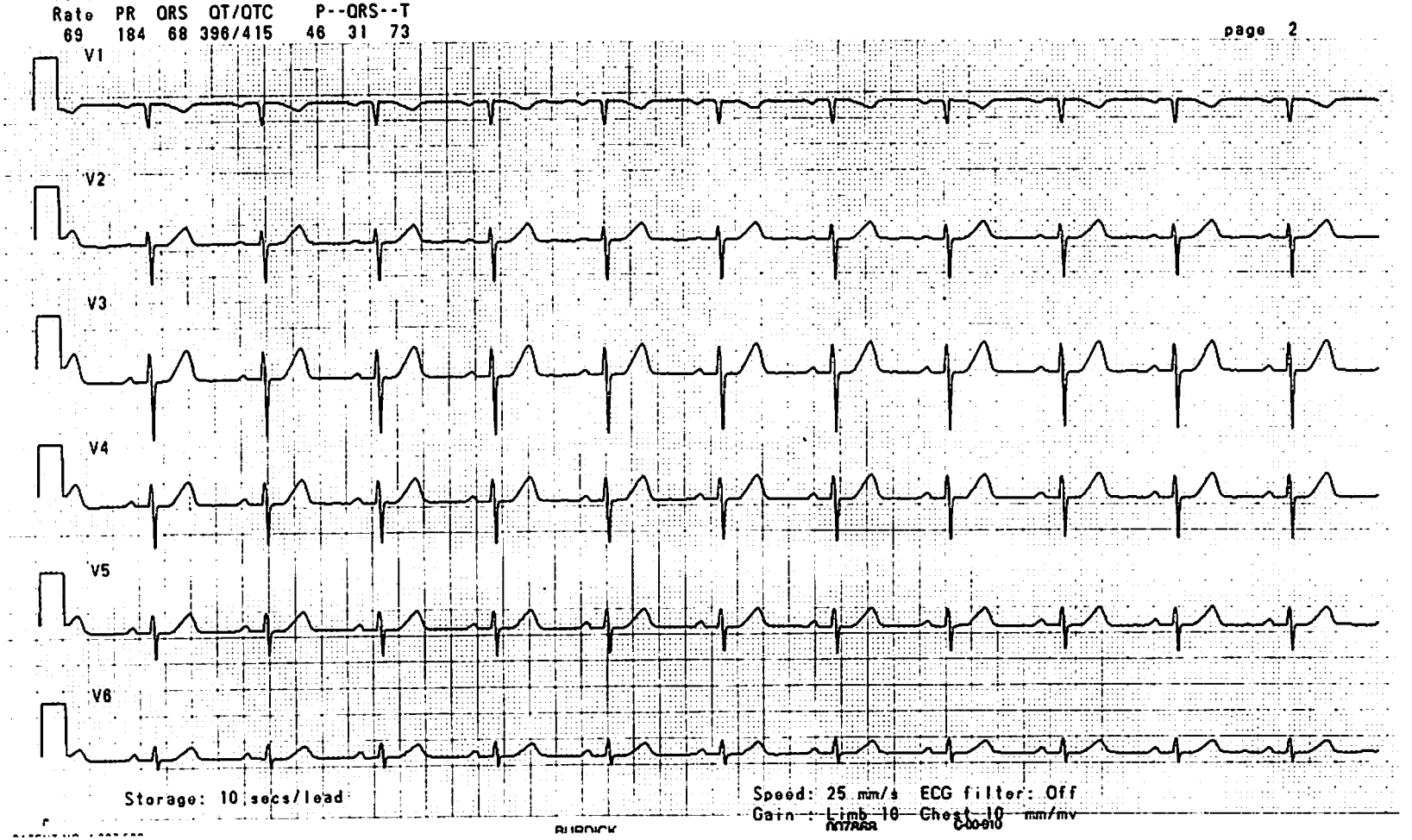
Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36

SINUS RHYTHM
NORMAL ECG

Vent Rate	Durations PR	QRS	QT/QTC	Axes P	QRS	T
69	184	68	396/415	46	31	73

page 1




Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36
Vent Durations Axes
Rate PR QRS QT/QTC P--QRS--T
69 184 68 396/415 46 31 73
SINUS RHYTHM
NORMAL ECG
page 2
V1
V2
V3
V4
V5
V6
Storage: 10 secs/lead
Speed: 25 mm/s ECG filter: Off
Gain : Limb 10 Chest 10 mm/mv

Rhythm

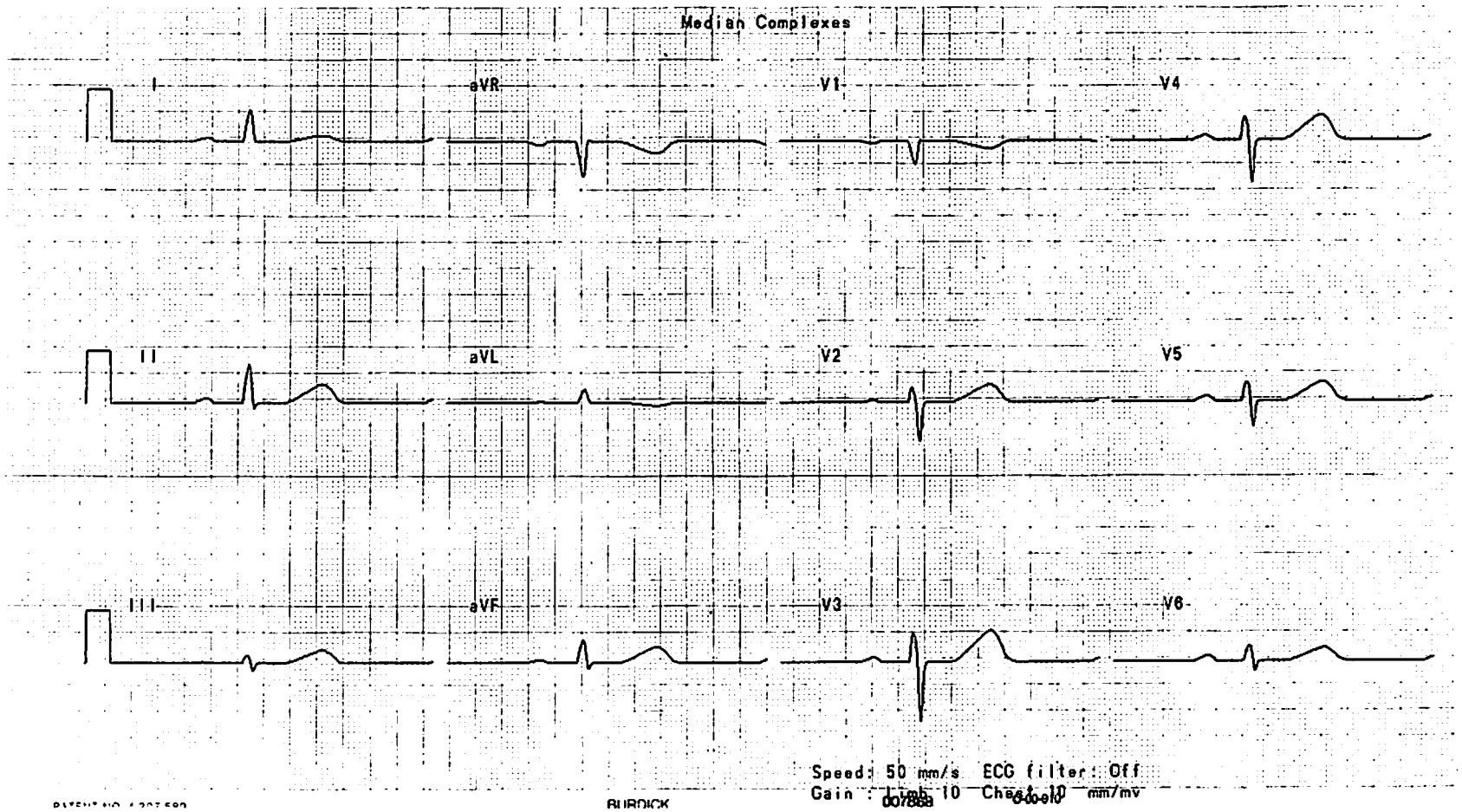
Name: GOLZ, RANDY
ID : 1128
12:33 12/04/89
Speed: 25 mm/s ECG filter: Off
Gain : Limb 10 Chest 5 mm/mv

Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/Lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36

	I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6	
PA	70	90	30	0	25	60	0	40	90	100	110	110	PA
PPA	0	0	0	-80	0	0	-60	0	0	0	0	0	PPA
EQD	0	0	0	65	0	0	57	0	0	0	0	0	EQD
QD	0	0	0	51	0	0	50	0	0	0	0	0	QD
QA	0	0	0	680	0	0	450	0	0	0	0	0	QA
RD	68	48	39	0	68	46	0	33	35	36	38	42	RD
RA	610	750	150	0	265	445	0	280	550	450	360	300	RA
SD	0	18	25	0	0	18	0	35	33	32	30	26	SD
SA	0	100	160	0	0	115	0	760	1140	820	510	190	SA
RPD	0	0	0	0	0	0	0	0	0	0	0	0	RPD
RPA	0	0	0	0	0	0	0	0	0	0	0	0	RPA
SPD	0	0	0	0	0	0	0	0	0	0	0	0	SPD
SPA	0	0	0	0	0	0	0	0	0	0	0	0	SPA
MAXRA	610	750	150	0	265	445	0	280	550	450	360	300	MAXRA
MAXSA	0	100	160	680	0	115	450	760	1140	820	510	190	MAXSA
QRSA	395	429	34	-415	176	226	-273	-192	-156	-62	33	117	QRSA
STJ	5	0	-5	-3	5	-3	0	-8	-13	-8	-3	-3	STJ
STM	0	0	0	0	0	0	0	0	0	0	0	0	STM
STE	10	10	0	-10	5	5	-10	10	20	20	20	20	STE
STLIM	300	300	400	400	300	300	400	400	400	400	400	300	STLIM
MINST1	0	0	-5	-3	0	-3	0	-8	-13	-8	-3	-3	MINST1
MINST2	0	0	0	-10	0	0	-10	0	0	0	0	0	MINST2
MAXST	10	10	0	0	5	5	0	10	20	20	20	20	MAXST
TA	110	360	250	-235	-70	305	-160	340	800	490	370	250	TA
TPA	0	0	0	0	0	0	0	0	0	0	0	0	TPA
MTA	100	350	240	-230	-75	295	-150	330	580	470	350	230	MTA
MXFLG	1	1	1	0	0	1	0	1	1	1	1	1	MXFLG

Median Complexes

Name: GOLZ RANDY
ID : 1128
Age : 40 Sex : Male
Hgt : 75 Wgt : 175
B/P : 120/60 Race: Caucasian
Optn: NONE
Med1: Proc/lido/Tocainide
Med2: Quinidine/Norpace
Tech: RTY Dr. : JOHNSON
Site: 0 Unit: 0
Date: 12/04/89 Time: 12:36



PATENT NO. 4,297,582 BURDICK 007853

Appendix C - FAA Option

ABOUT THE FAA MODE

When the optional FAA mode is enabled, the E550 is compatible with a computer system used by the Federal Aviation Administration. The basic operation is not changed. However, in the FAA mode, all records are saved in the Full format (10 seconds per lead), and the demographic headings are different. Also, the STAT ECG and PRINT RHYTHM keys are not available.

Entering and Exiting the FAA Mode

FAA MODE → Activates the FAA mode (Fig. C-1). When the Main Menu reappears, the FAA mode is enabled.

END FAA MODE → Exits the FAA mode (Fig. C-2).

☞ *NOTE: The E550 exits from the FAA mode and reverts to normal operation whenever the ON/STBY key is pressed.*

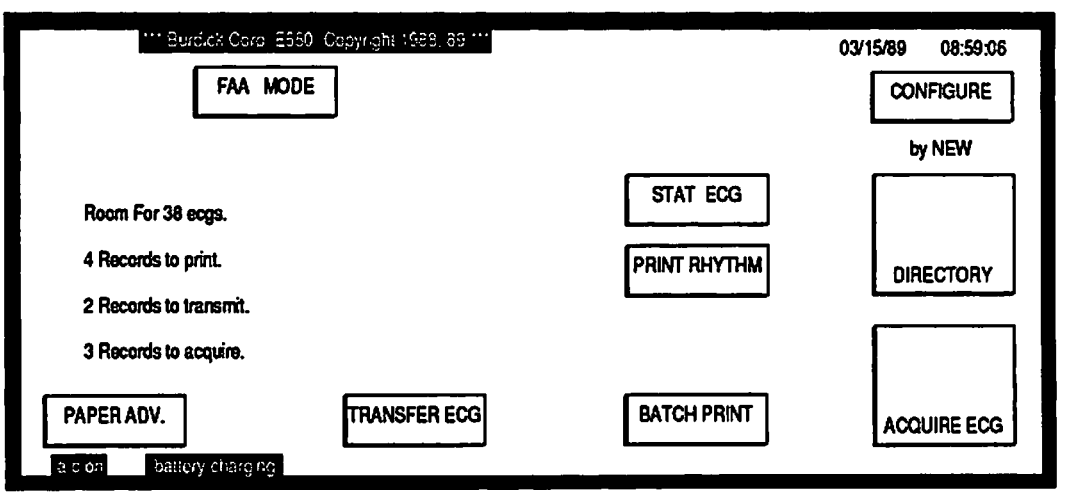


Figure C-1 *Start FAA Mode*

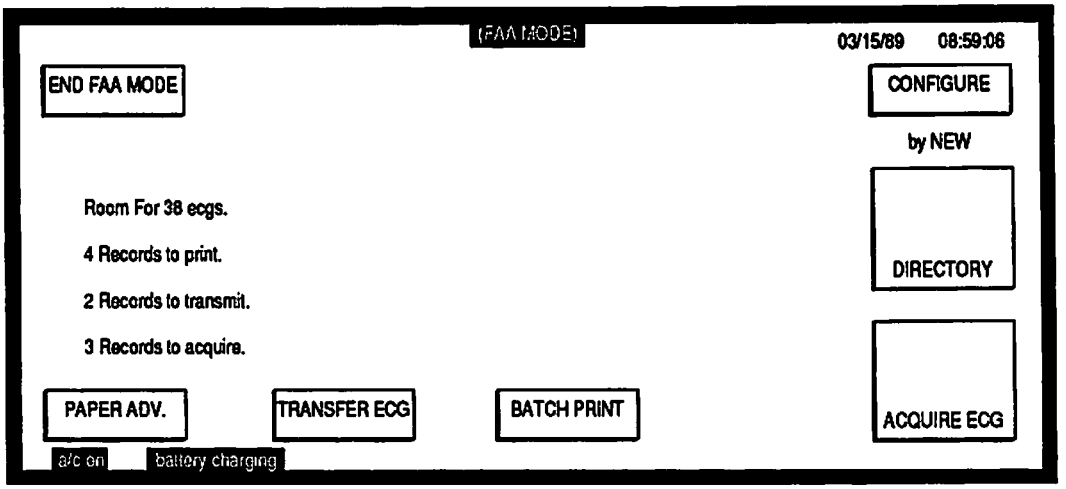


Figure C-2
End FAA Mode

Patient Demographics in FAA Mode

Patient data is entered in the normal fashion (see ENTERING PATIENT DEMOGRAPHICS in Section 4). However, in the FAA mode, the demographic headings are somewhat different. This is required to assure compatibility with the FAA computer system.

The FAA mode demographic headings are as follows:

Name (last, first):
Enter the last name, type a comma, then enter the first name. (For example: SMITH, JOHN)

Social Security #:
Enter the social security number (9 digits). This number should not have any spaces between digits and should not be longer than nine digits.

Option digit:
This number is the airman's class code (1 digit).

AME#:
The AME# is a five digit number which identifies the authorized medical examiner. For convenience, this number remains in memory until you change it.

Age:
Use the numeric keys to enter the patient's age.

Sex:
Select the patient's sex.

Hgt:
Use the numeric keys to enter the patient's height.

Wgt:
Use the numeric keys to enter the patient's weight.

Syst:
Use the numeric keys to enter the patient's systolic blood pressure.

Dias:
Use the numeric keys to enter the patient's diastolic blood pressure.

Race:
Select the patient's race.

Med:
If applicable, select a medication from the list.

Sending FAA Records

You can send records in the normal fashion (see TRANSFERRING RECORDS in Section 4). However, the RECEIVE CUSTOM HEADER and RECEIVE ACQUISITION REQUESTS keys are not available in the FAA mode.

The current phone number for sending FAA records is **312-517-7042**. Please check with your Burdick Representative to verify this number before attempting to send any records. This number can be entered as the default (see CONFIGURING THE E550), or it can be entered at the time of transfer.

☞ *NOTE: When batch transmitting FAA records, check to be sure that only those records acquired in the FAA mode are marked (with an X) in the Directory. Otherwise, the E550 may send records which do not conform to the FAA configuration.*

Appendix D - Stress Option

ABOUT THE STRESS MODE

When the optional Stress mode is enabled, the E550 communicates with a Burdick monitor / treadmill controller to become part of an exercise stress testing system. The Stress mode allows you to enter or edit patient demographics, select various stress options, and access Directory records. The STAT ECG and PRINT RHYTHM keys are not available in Stress mode.

Entering the Stress Mode

STRESS MODE → From the Main Menu (Fig. D-1), press this key to activate the Stress mode and display the Main Stress Menu (Fig. D-2).

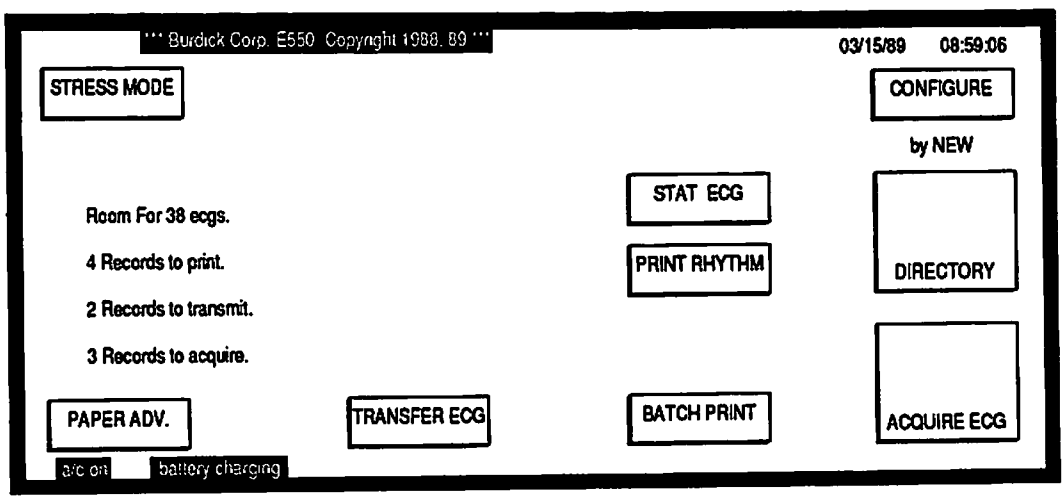
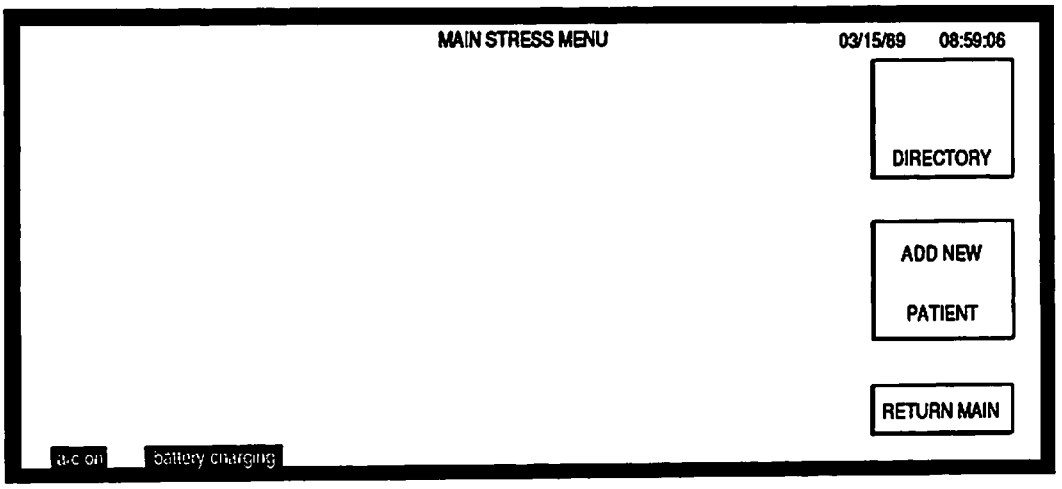


Figure D-1 *Begin Stress Mode*

Figure D-2
Main Stress Menu

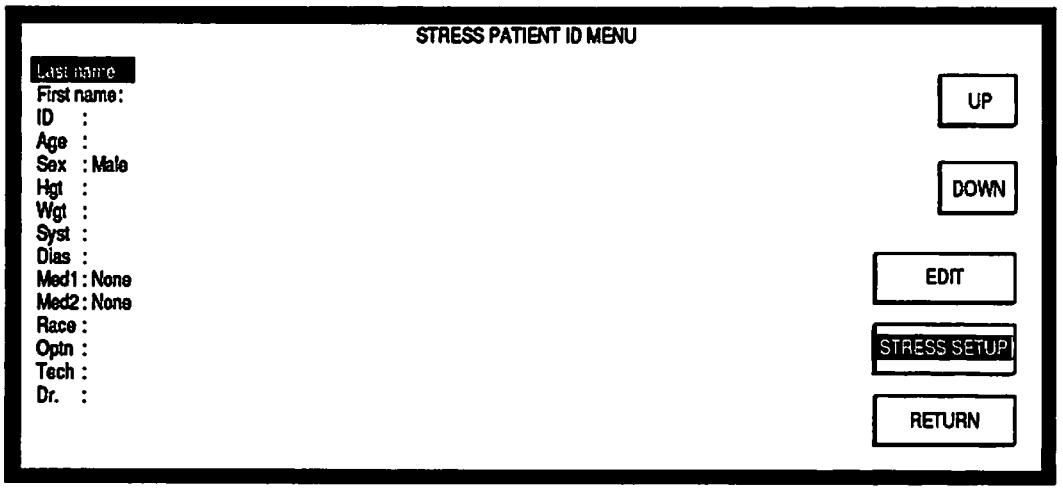


The Main Stress Menu (Fig. D-2) is the starting point for all of the Stress mode functions. The DIRECTORY key provides access to the Directory (see Selecting Directory Patients for Stress). ADD NEW PATIENT lets you enter demographic information for new stress patients. RETURN MAIN exits the Stress mode and returns to the Main Menu.

New Patient Demographics in Stress Mode

To enter demographics for a new patient, select ADD NEW PATIENT from the Main Stress Menu or from the Directory. This displays the Stress Patient ID Menu (Fig. D-3).

Figure D-3
Stress Patient ID Menu



The Stress Patient ID Menu functions similarly to the patient identification menus described in Section 4. The UP and DOWN keys allow you to scroll through the various items. EDIT allows for editing of the selected menu item. RETURN causes the E550 to go back to the Directory or Main Stress Menu, depending upon the point of origin.

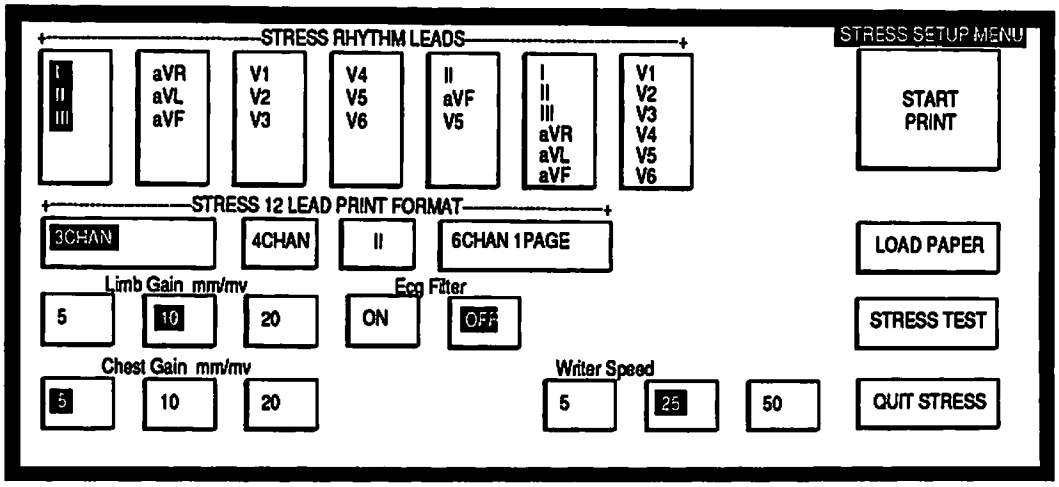
Stress Set-Up Options

The set-up options for stress are selected as follows:

STRESS SETUP → From the Stress Patient ID Menu (Fig. D-3), press this key to display the Stress Set-Up Menu (Fig. D-4).

From the Stress Setup Menu (Fig. D-4), you can select rhythm lead groups, 12-lead print format, limb and chest gains, writer speed, and the ECG filter setting. For 4CHAN, you can select which lead will be in the fourth channel of the printout.

Figure D-4
Stress Setup Menu

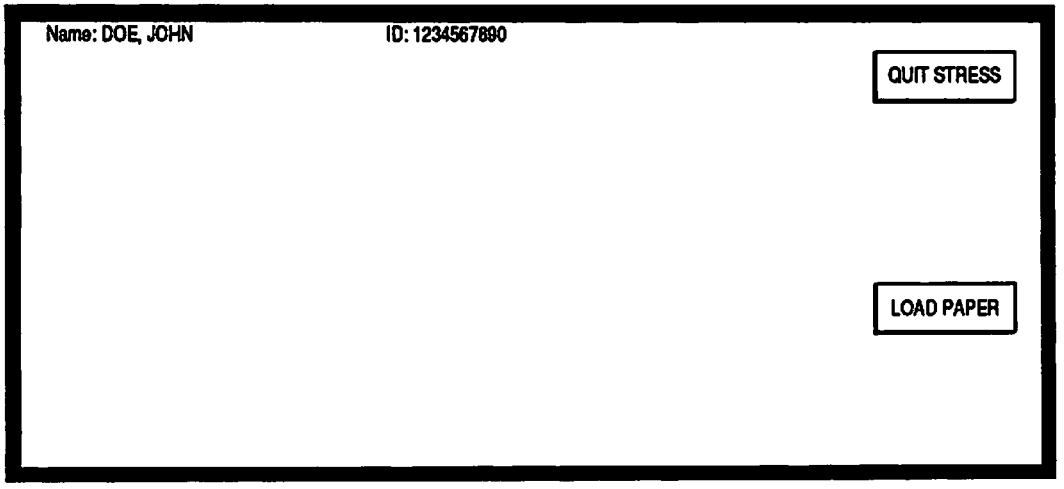


These keys also appear on the Stress Setup Menu:

START PRINT → Begins printing a rhythm strip. You may select other set-up options while printing. Press STOP PRINT to end the printing.

STRESS TEST → Begins the stress test . The E550 communicates with the monitor / controller and displays the screen shown in Fig. D-5. After the treadmill enters the Warm-Up Phase, QUIT STRESS disappears from the screen. When the stress protocol is complete, the treadmill enters the Final Report Phase and QUIT STRESS reappears.

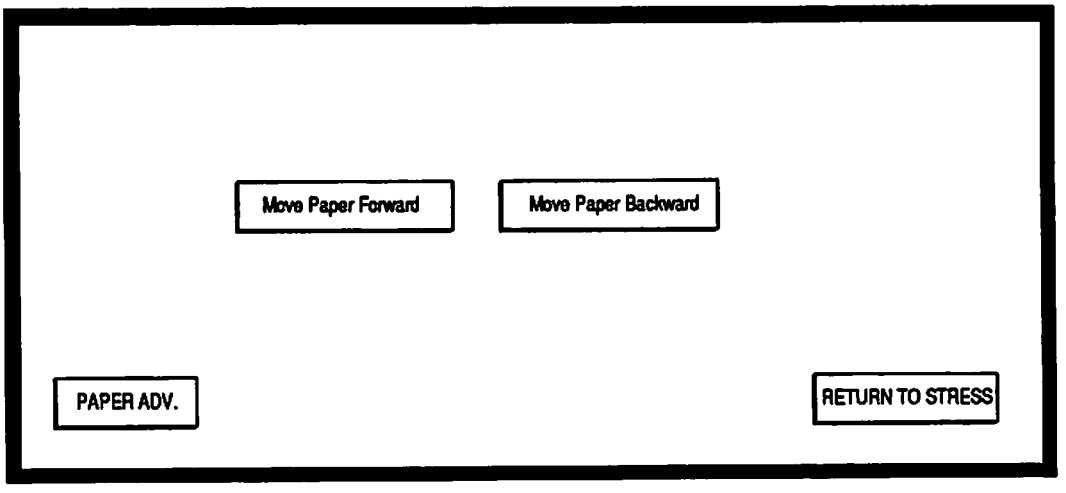
Figure D-5
During Test



LOAD PAPER → Interrupts communication with the monitor and displays the screen shown in Fig. D-6. This screen lets you jog the paper forward or backward and advance the paper one full sheet at a time. Press RETURN TO STRESS to return to the previous menu.

QUIT STRESS → Returns to the Main Stress Menu (Fig. D-2). Note that this function is not available while the monitor / controller is governing the stress test.

Figure D-6
Paper Jog



Selecting Directory Patients for Stress

Directory records are displayed in the normal fashion (see USING THE DIRECTORY in Section 4). For convenience, the E550 allows you to select patients from the Directory for stress.

Refer to Fig. D-7 for the following:

CURRENT PATIENT FOR STRESS → Selects the current patient for stress. The Stress Patient ID Menu (Fig. D-3) appears, and you can EDIT demographics or proceed to the Stress Setup Menu (Fig. D-4) by pressing STRESS SETUP. To go back to the Directory, press RETURN from the Stress Patient ID Menu.

If an ECG has already been acquired for the current selection, a new record can be generated simply by selecting CURRENT PATIENT FOR STRESS, then RETURN. This produces an additional record in the Directory with the same patient demographics, but no ECG information.

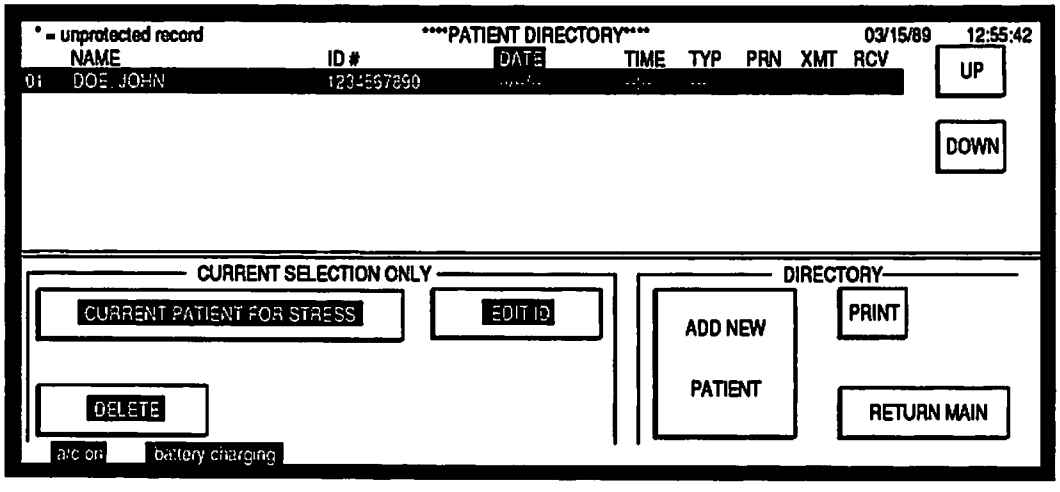


Figure D-7
Directory

EDIT ID → Edits the current patient demographics. (See ENTERING PATIENT DEMOGRAPHICS in Section 4.)

DELETE → Deletes the current record. This key only appears for records which do not have an ECG.

Warranty & Service Information

SIEMENS BURDICK MAKES NO WARRANTY OTHER THAN THE ONE SET FORTH HEREIN. SUCH LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING BUT NOT LIMITED TO ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES AND SUCH CONSTITUTES THE ONLY WARRANTY MADE WITH RESPECT TO THE PRODUCTS.

Your Siemens Burdick Limited Warranty:

Any equipment* component which fails to operate in normal use during the period of one year from the purchase date will be exchanged without charge. However, the customer assumes all responsibility for shipping charges.

All accessories supplied with new equipment are warranted for ninety (90) days, and will be repaired or replaced at Siemens Burdick's option. Accessories sold separately are warranted for a period of ninety (90) days from the date of original purchase.

This warranty gives you specific legal rights. You may have other rights which vary from state to state. This warranty does not apply to equipment damaged by shipping, accident, misuse, theft, neglect, fire or Acts of God, deterioration caused by use of chemicals not encountered during normal operation, equipment failures due to use of paper or other supplies not conforming to Siemens Burdick approved specifications and standards, or unauthorized modifications.

Authorized Siemens Burdick dealers are responsible for maintaining the Siemens Burdick equipment they sell. They are equipped to provide on site field service whenever it is practical. If trouble occurs, contact the Siemens Burdick dealer from whom the equipment was originally purchased to arrange for service. The engineering and service specialists of Siemens Burdick, Inc. are always ready to assist customers and dealers; repair information can be supplied by telephone or mail.

The manufacturer's warranty card should be returned by the dealer/installer. In the event a warranty card was not returned, the following information must be supplied to Siemens Burdick before warranty support can be provided:

1) Customer name and address.
2) Equipment model, serial number and date of installation.
3) Installation date of new part, new accessory or new unit.
4) Name of dealer from whom equipment was purchased.
5) Complete description of unit's condition; state if symptoms are constant or intermittent.
6) Complete list of all steps taken in attempt to remedy problem.

Service:

Siemens Burdick products are sold and serviced through a nationwide network of medical equipment distributors who have been carefully selected for their proven ability to serve the medical profession. All of these Authorized Service Agents participate in an ongoing certification program and must demonstrate a high caliber of technical expertise. Service, parts and accessories for Siemens Burdick equipment are available from your authorized Siemens Burdick dealer. For more information or special assistance, contact Siemens Burdick, Inc. at (800)-333-7770 or (608)-868-6000.

Returning Equipment for Service:

If equipment is being returned to a service center for repair, prior authorization must first be obtained by phone or mail. Always include a detailed list of symptoms, and if applicable, a sample trace recording. Please include your name and phone number. This will assure you are provided with the fastest and most efficient service possible. If circuit boards are shipped to a service center, always ensure they are adequately protected and enclosed in an anti-static bag.

If a unit must be returned to the Siemens Burdick factory or to a Regional Service Center for repair, the unit and accessories should be carefully packed in a strong carton, preferably the one specifically designed for that unit. Shipping containers are available from your Siemens Burdick dealer, however, the customer is responsible for and assumes all risks associated with shipment of the unit. Ensure that the package is clearly marked for protection against rough handling. Example: "DELICATE ELECTRONIC EQUIPMENT - HANDLE WITH CARE".

*Equipment is considered to be the main electronic assembly, and by definition does not include any accessories.

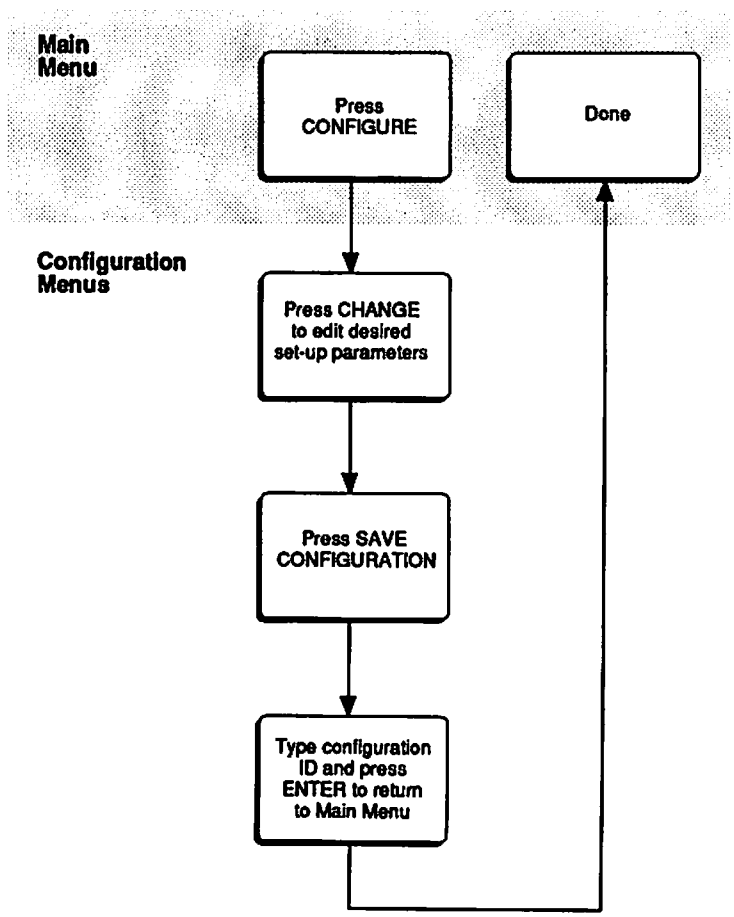
Quick Reference

After taking some time to read through the manual and become familiar with the menu system, you will find the E550 very easy to operate. This Quick Reference provides brief guidelines for:

- Changing the configuration parameters
- Acquiring and printing a 12-lead ECG in the auto, semi-auto, or manual mode
- Printing a rhythm strip
- A block diagram shows the basic structure of the menu system.

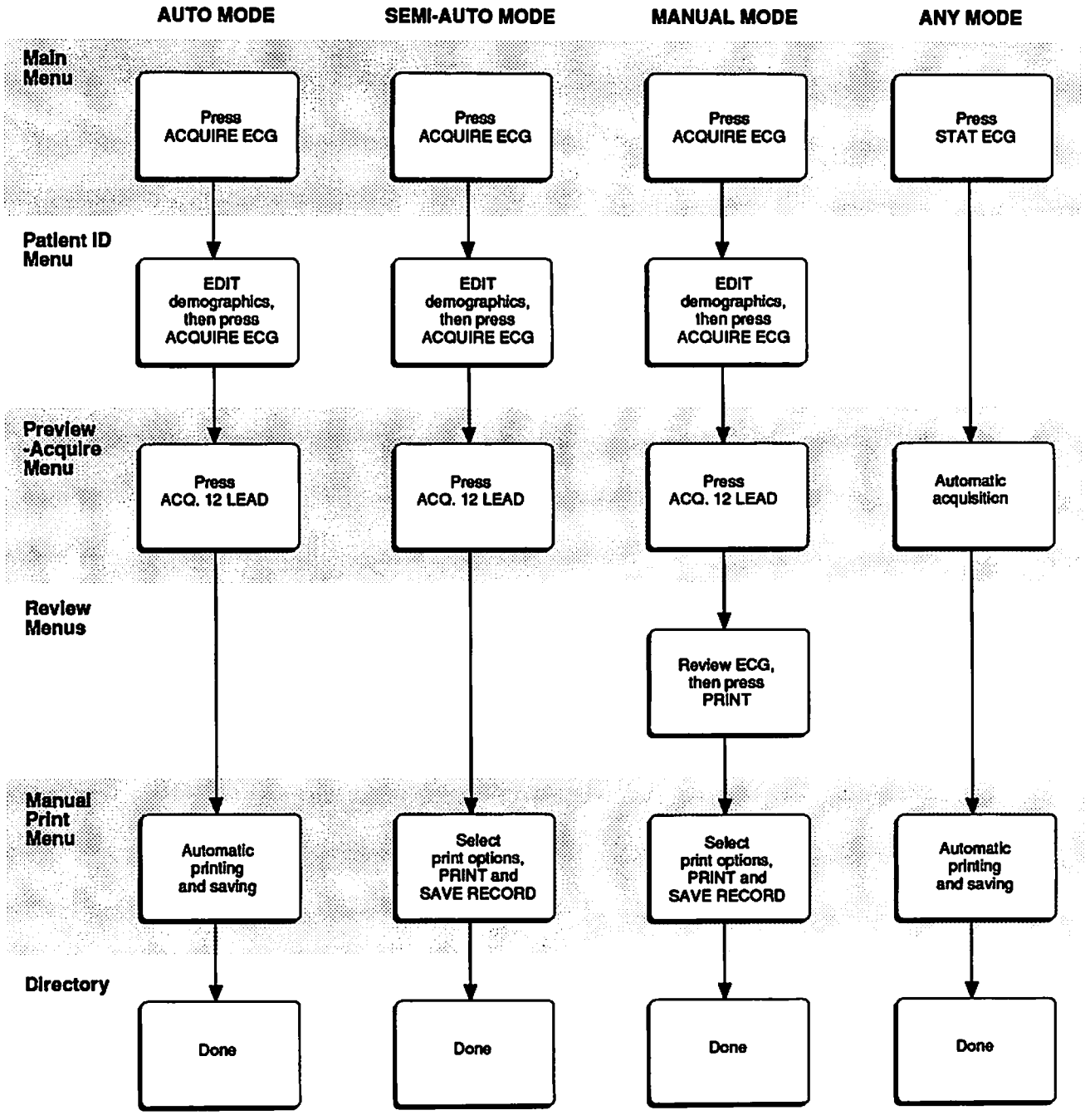
☞ *NOTE: The E550's menu system is very flexible. There are many alternative ways to access various features. Please read the manual for complete details!*

Quick Reference: *Configuring the E550*


Main Menu
Press CONFIGURE
Done
Configuration Menus
Press CHANGE to edit desired set-up parameters
Press SAVE CONFIGURATION
Type configuration ID and press ENTER to return to Main Menu

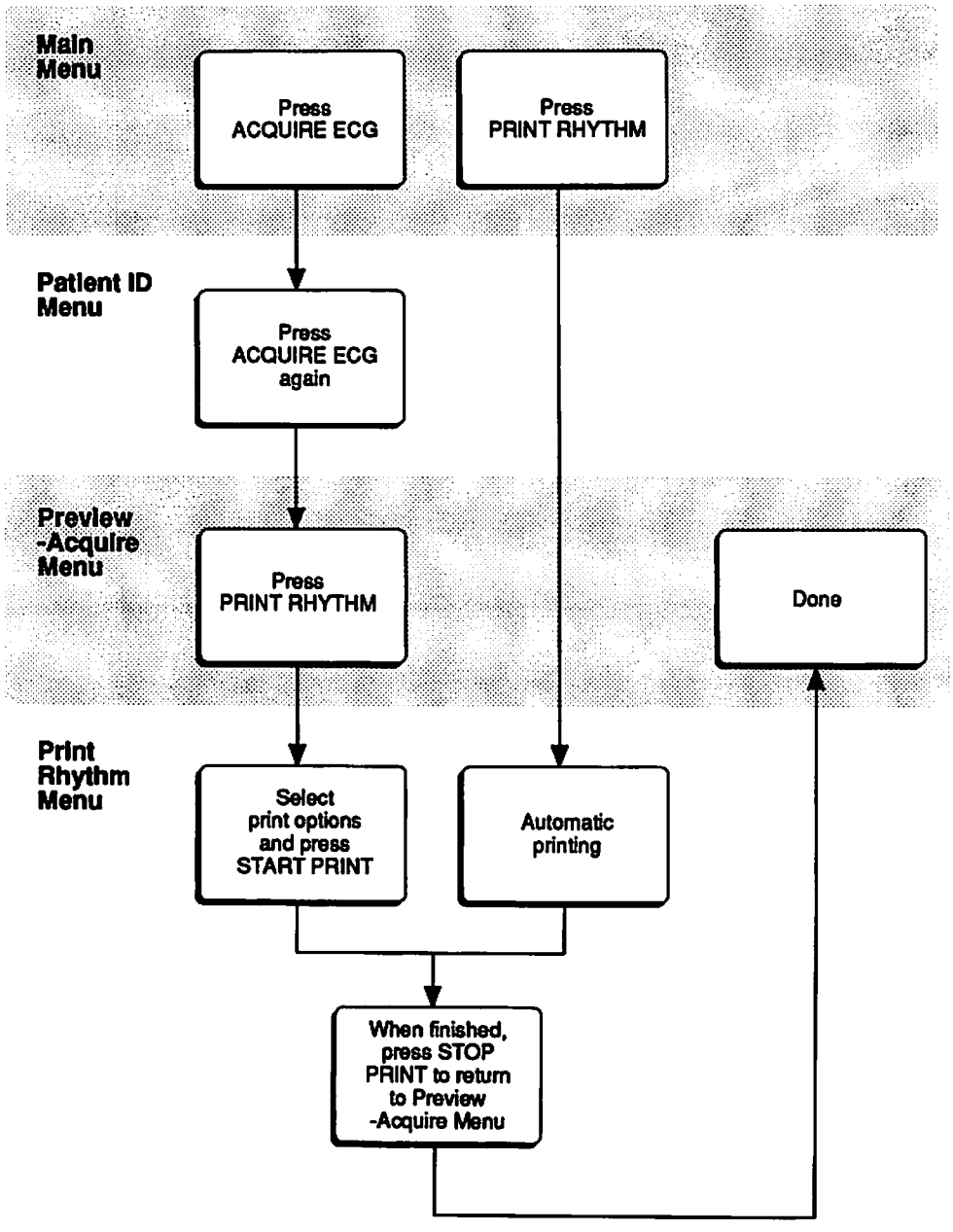
NOTE: Starting point is the Main Menu.

Quick Reference:
Acquiring and Printing a 12-Lead ECG

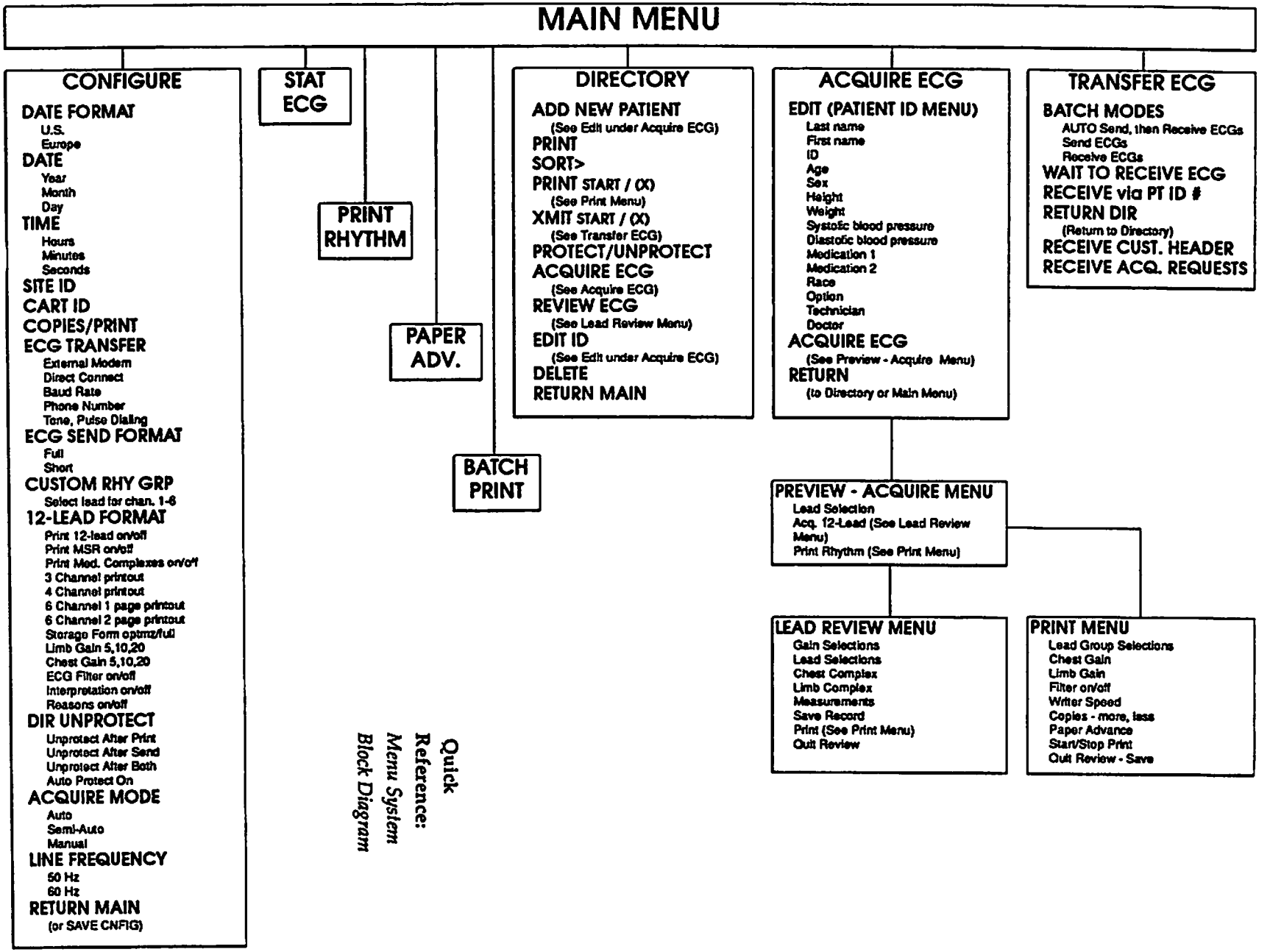


NOTE: Starting point is the Main Menu. If ACQUIRE ECG is pressed a second time without entering patient demographics, the Patient ID Menu re-appears after the acquisition. If RETURN is pressed from the Patient ID Menu, the acquisition is aborted and the record is not saved. Also, you can quickly acquire an ECG by pressing STAT ECG from the Main Menu.

Quick Reference: *Printing a Rhythm Strip*



NOTE: Starting point is the Main Menu. The print options may be changed any time during the printouts. Also, you can quickly print a rhythm strip by pressing PRINT RHYTHM from the Main Menu.



Quick Reference: *Menu System Block Diagram*

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Service: (800) 333-7770 • Orders: (800) 777-1777

Siemens Burdick, Inc. 15 Plumb Street Milton, WI U.S.A. (608) 868-6000

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